Niagara Peninsula Transportation Needs Assessment Study

Demand Forecasting

Ontario

Regional NIAGARA

THE New! CITY OF HAMILTON

TSH engineers architects planners

MRC McCORMICK RANKIN CORPORATION

ecoplans

NIAGARA PENINSULA TRANSPORTATION NEEDS ASSESSMENT STUDY

Demand Forecasting

October 2001

TSH
engineers
architects
planners

Table of Contents

APPENDICES

1 INTRODUCTION

In June 2000, Totten Sims Hubicki Associates and McCormick Rankin Corporation were retained to perform the Niagara Peninsula Transportation Needs Assessment. This project provides a strategic overview of the long term transportation needs in the Region of Niagara and the City of Hamilton. The study provides an assessment of potential network conditions in the 10, 20 and 30 year planning horizon from both a transportation service and economic perspective.

This document has been prepared such that the body of the report provides summary details relative to the background, approach, assumptions and criteria, and conclusions and recommendations. The details regarding the technical analysis are attached as appendices to this document.

1.1 Past Work

The Ministry of Transportation has conducted several major transportation studies in the Niagara Peninsula area in the 1990's.

1.1.1 Transfocus 2021

Perhaps the most comprehensive of the previous transportation studies was Transfocus 2021 – A Strategic Transportation Plan for the Niagara-Lake Erie Area, completed in 1995. This study offered a wide range of recommendations for provincial and municipal transportation improvements within the Niagara Peninsula to the year 2021.

The Niagara Peninsula Transportation Needs Assessment Study builds on, and carries forward, many of the recommendations of Transfocus 2021.

1.1.2 Highway 420 Extension

In 1998, the Ministry initiated an environmental assessment study for a Highway 420 Extension, as recommended in Transfocus 2021. The proposed extension, westerly from the QEW to the Thorold Tunnel, was intended to provide another highway route between Niagara Falls and St. Catharines to divert traffic from the QEW through St. Catharines during rehabilitation of the Garden City Skyway and widening of the QEW.

1.1.3 Niagara Frontier International Gateway Study

The completion of the Highway 420 E.A. study was deferred on the basis of the findings of MTO's Niagara Frontier International Gateway Study (1998). This study was initiated in response to the Transfocus 2021 recommendation to consider an 8 lane widening of the QEW and a new potential Mid-Peninsula Corridor (MPC) through the Niagara area. The Gateway study concluded that both would be required over the long term, but did not address specific Mid-Peninsula Corridor alternatives or feasibility.

1.1.4 Niagara Escarpment Crossing Study

The Region of Niagara carried out the Niagara Escarpment Crossing Study in 1997 to address the issue of truck traffic on municipal roads crossing the Niagara Escarpment through small communities. This study

recommended that a commercial trucking route be designated within Niagara and an improved escarpment crossing be constructed. The study further recommended that a feasibility study of the Mid-Peninsula Corridor be undertaken. The Region of Niagara plans to initiate an EA for a regional link crossing the escarpment in the near future.

1.1.5 Niagara Regional Transportation Strategy

Neither Niagara Region, nor the City of Hamilton, has carried out a recent large scale comprehensive, multi-modal transportation study. Niagara, however, has recently initiated a comprehensive Regional Transportation Strategy to examine how the transportation system can be developed to support and shape future development and promote economic growth in the area. This initiative will include an assessment of all modes – auto, truck, transit, rail, air, marine, pedestrian and bicycle. The recommendations from this Transportation Needs Assessment Study will be considered in the context of the development of a regional transportation strategy.

1.1.6 Niagara Falls Transportation Master Plan

In 1998, the City of Niagara Falls, in conjunction with the Region of Niagara and the Ministry of Transportation, undertook a Transportation Master Plan to develop a multi-modal transportation strategy to address existing and future travel demands within the community. Niagara Falls has a relatively small population (80,000) but accommodates between 14 and 15 million visitors a year. The study identified that the limitation to growth in visitation to Niagara Falls was transportation services within and to the community. Access to the community is currently constrained by:

- The capacity of the QEW;
- The capacity of international bridge crossings; and
- Access to the community via Highway 420.

1.2 Purpose/Scope

The purpose of the demand forecasting working paper is to describe the existing and determine the future travel and traffic characteristics in the analysis area. The volume forecasts and travel characteristics were used to determine the long term transportation needs in and through the Region of Niagara. The primary focus of the forecasting work was the provincial highway system.

1.3 Analysis Area

The Niagara Peninsula Transportation Needs Assessment Study focused on the geographical area associated with the Regional Municipality of Niagara and the City of Hamilton (formerly Regional Municipality of Hamilton-Wentworth) as shown by the map in **Appendix A**.

As Niagara Region and City of Hamilton are part of the broader Golden Horseshoe Area, the transportation linkages with the Greater Toronto Area (GTA), Haldimand County, and the Kitchener-Waterloo-Guelph area were also considered as part of the study.

In addition, given the proximity to the United States and the strategic role of the Niagara Peninsula as a major international gateway and economic corridor, the bridge crossings into New York State were

examined in the context of projecting traffic growth on the facilities

1.4 Key Considerations

The following are some of the critical issues addressed as part of the demand forecasting exercise:

- The Queen Elizabeth Way (QEW) currently represents the only Provincial highway that links the international bridge crossings in Niagara with the GTA;
- The QEW, at four lanes through St. Catharines, is currently operating at capacity and requires upgrading (a Class EA for a widening to 6 lanes is currently being completed and will be available for public review in July of 2001). There is a need to determine the ultimate configuration of the highway relative to other network or system improvements;
- Traffic analysis and forecasting indicates that beyond 2021, there will be at least a two lane (freeway lanes) peak hour deficiency in an east-west direction through the Niagara Peninsula. This assumes that the planned six lane widening through St. Catharines has been implemented;
- The QEW also represents the key linkage between the GTA, Niagara Region and Niagara Falls providing access for tourists/visitors to the area;
- Sections of Highway 403 through Hamilton are operating at capacity with limited opportunities for upgrading;
- The QEW from the Burlington Bay Skyway to the Freeman Interchange in Burlington, will reach capacity in the near future;
- Increases in commercial vehicle traffic as a result of changing economic and regulatory conditions (North American Free Trade Agreement), economic growth in Ontario and changing goods movement practices ("just-in-time delivery") will continue to place additional pressures on the transportation network;
- The ability of any MPC alternative to be self supporting (ie. generating sufficient revenue to cover all costs associated with the facility: construction, operating, maintenance, financing);
- Toll rate policies and impacts on revenue;
- Sensitivity testing related to land use, toll rates, and daily use of the facility;
- Other financial opportunities associated with the development of the MPC, including deferral of construction costs from other construction, notably QEW through St Catharines;
- Changes to assumptions which would impact volumes and toll revenue; and
- Need to recognize that each component of MPC may have different levels of financial viability and therefore it may be necessary to construct segments of the network that are not financially self-supporting in order to achieve the overall network goals.

2 LAND USE

2.1 OGTA Forecasts

Population and employment assumptions used to develop the future trip matrices for the MTO were based on the forecasts developed by the Office of the GTA (OGTA) in March 2000. These forecasts are summarized in **Appendix B**.

The OGTA forecasts are based on employment to population ratios for each Region. These ratios consider a continuation of the concentration of employment within Toronto with some increases in the outlying Regions to account for increased self-containment, so as to make most efficient use of the existing infrastructure, particularly the TTC and GO systems.

The population and employment forecasts used for this study have been accepted by the area municipalities/Regions on a municipal basis. Within each municipality, there have been different assumptions for local distribution base on local knowledge of development areas and building permits available to the Region. The allocation of population and employment to the traffic zone level of detail was provided by the individual municipalities.

2.2 Hinterland Growth

It is anticipated that future transportation congestion in the GTA may result in a "spill-over" of a portion of future population and employment growth from the GTA to surrounding municipalities. Niagara and Hamilton are well positioned to attract and accommodate some of this potential growth. Additional increases in population and employment were considered as a future scenario in the demand forecasting component of the study.

Both Niagara and Hamilton have an adequate supply of land available for development. Lands currently designated in both Municipal Official Plans can accommodate an accelerated level of growth in areas that can readily be provided with municipal services.

Higher population and employment growth will result in greater levels of local and inter-regional travel demand within the analysis area. This will translate to increased automobile travel; currently, much of the local travel is on a limited number of provincial and municipal roads, some of which are experiencing operational and/or capacity problems.

In making business location decisions, transportation access and mobility are only two of many variables considered by industry. Given the anticipated congestion levels in the GTA however, combined with the importance of the Niagara Peninsula as an international trade corridor, it can be anticipated that transportation access will be an important consideration in future business location decisions.

Population and employment forecasts confirm that the GTA is, and will continue to be by far the most predominant influence on travel through the Niagara Peninsula. Population growth forecasts for the GTA as shown in **Appendix B** significantly outstrip forecasts for other locations including the bordering American states.

The Hinterland Growth Scenario reflects the "spill-over" effect resulting from congestion in the GTA. This "spill-over" will affect all hinterland areas surrounding the GTA, including Hamilton and Niagara. The re-allocated population and employment forecasts for the 2031 horizon year are provided in appendix B. It is important to note that this scenario was used only as a sensitivity test, in order to frame a likely maximum case for the interactions between Hamilton and Niagara that may put greater pressures on the QEW corridor.

3 TRANSPORTATION SYSTEM

The transportation network in the Niagara-Hamilton area as depicted in **Appendix C** is multi-modal in nature and is a combination of road, marine, rail, air and transit facilities. Key factors or barriers influencing or affecting the provision of transportation services and mobility in the analysis area include:

- The Niagara River;
- The Welland Canal;
- The Niagara Escarpment; and
- The Burlington Bay Skyway;

These existing natural and man-made constraints restrict the provision of transportation facilities to a limited number of road and rail corridors and crossings.

3.1 Niagara Gateway Crossings

The four international road bridges crossing between Ontario and New York State represent the major components of the transportation system. The efficient operation of these facilities is fundamental in facilitating international trade and tourism.

The Peace Bridge and the Queenston-Lewiston Bridges are the key truck crossings. Over the period 1995 to 2000, annual truck traffic grew by 28 % representing 540,000 vehicles across the Niagara frontier. The Niagara crossings constitute 29% of all Ontario-U.S. commercial traffic and 77 % of traffic between Ontario and New York. Peace Bridge truck volumes rose by 26 % to 1.4 million annually and Queenston-Lewiston Bridge truck traffic increased by 32 % to just over 1 million over the same period.

On an average day (Monday-Sunday) 7,100 trucks travel across these two Niagara bridges carrying a combined $280 million worth of goods per day. On an average weekday (Monday-Friday) the truck volume is even higher - 8,600 carrying some $340 million worth of goods every weekday.

The four international bridge crossings are also critical to the movement of tourists in and through the Niagara peninsula. Over the past 15 years, cross-border automobile traffic has fluctuated with the Canadian-U.S. exchange rate. While Canadian tourists and shoppers appear to be highly dependent on the value of the Canadian dollar, in contrast, U.S. travellers appear not to be affected by the valuation as the price differential has generally been in their favour over the last decade.

While a slight increase in annual travel by U.S. residents to Niagara Falls can be attributed to the opening of the "interim" casino in 1996, the decrease in Canadian cross-border travel has negated any significant increase cross border travel. Total passenger traffic has not yet returned back to levels experienced in the early 1990's, when the Canadian dollar was worth $0.90 U.S. The falling Canadian dollar clearly has an affect on the propensity for Canadians to vacation and shop in the United States.

With a high Canadian dollar value, a greater number of Canadians are attracted to the U.S.; during the early 1990's, approximately two-thirds of the cross-border traffic was Canadian. By 2000, the Canadian dollar had decreased to $0.67U.S. resulting in four million fewer Canadian vehicle trips to the U.S. American vehicles presently comprise approximately two-thirds of all cross-border passenger vehicle

traffic.

While a large amount of the cross-border passenger traffic is related to Niagara Falls, the QEW is the primary tourist route connecting the highway and road system to the bridges.

There are three international rail crossings in the Niagara Peninsula:

- Canadian National (CN) utilizes the upper deck of the Whirlpool Bridge in Niagara Falls. This structure is used by VIA and Amtrak passenger rail traffic.

- Michigan Central Bridge, which parallels the Whirlpool Rapids Bridge is currently used by Canadian Pacific traffic although there are ongoing discussions relative to rationalization of facilities in the area. This may result in the elimination of rail traffic from this bridge.

- The International Railway Bridge north of Fort Erie and Buffalo is owned by Canadian National (CN).

While truck is the predominant mode of transport for goods across the border, rail carries 32% of exports by value and 35% by weight. Therefore, both modes play a key role in the transport of freight through the Niagara Peninsula.

3.2 Queen Elizabeth Way (QEW)

The QEW is the major provincial highway through the Niagara Peninsula. Daily volumes are highest in the Hamilton area where a large number of commuters use the facility to travel between Hamilton and the GTA. A large number of local residents use the QEW through St. Catharines due to traffic congestion on east-west city streets.

QEW usage by tourist/recreational users is seasonal, with volumes 25% higher during the summer than the AADT. These location and peaking characteristics place significant pressure on sections of the QEW (i.e. through the St. Catharines and Hamilton areas).

3.3 Other Modes

3.3.1 Marine

The marine shipping industry plays an important role in the movement of goods through the analysis area. Marine is responsible for approximately 39% of the total tonnage of Canadian goods moved both domestically and internationally. Marine transport generally carries bulk commodity goods such as grain coal and other ores.

Key marine facilities within the analysis area include the Port of Hamilton and the Welland Canal. The Welland Canal is an integral part of the St. Lawrence Seaway as it links Lake Ontario to Lake Erie. In an average year, 12 million tonnes of cargo, on over 700 commercial ships, move through the Port of Hamilton, ranking it first in the entire St. Lawrence Seaway for the number of shipments and total tonnage handled.
It is expected that the tonnage of goods moved by marine will remain stable in the future as much of the goods carried are bulk commodity goods. Marine infrastructure is able to adapt to container shipping and

intermodality, which will allow it to remain competitive with rail and truck for long distance, bulk goods movement.

There is also the potential for an increase in passenger movement by marine (ferry). Previous daily ferry services between the Hamilton-Niagara area and the GTA have not proven to be financially viable. A ferry aimed at tourists is currently operating on weekends between Toronto and Queenston. A private sector proposal has been tabled regarding the operation of a ferry between Toronto and Rochester, New York. At the time of this writing, no service has been implemented in this regard.

3.3.2 Rail

Rail facilities carry goods and people both into and through the analysis area. Rail service in the analysis area is operated by: Canadian Pacific Railway, Canadian National, Port Colborne Harbour Railway (Trillium Railway), Canada Southern (CASO), GO Transit and VIA Rail.

Currently, rail moves approximately one-third of goods by value across the Peninsula. A review of economic factors affecting truck and rail traffic suggests that this share will remain stable over time. Total tonnage moved is anticipated to increase substantially over the long term, which implies substantial growth in rail freight.

GO Transit operates daily commuter trains and buses between Hamilton and the GTA. VIA Rail provides services to Niagara Falls and St. Catharines as part of their Toronto-Niagara Falls-New York route.

Between Niagara and the GTA, opportunities for commuting by rail appear to be limited as a result of the low number of commuters who actually travel from the Niagara Region to Hamilton or Toronto.

3.3.3 Air

There are three airports within the analysis area - the Hamilton International Airport, the Niagara District Airport and the Welland-Port Colborne Airport. The Hamilton International Airport specializes in courier and cargo transport, but continues to expand its passenger services. The others are local community airports.

Air freight and courier shipments are generally high value transactions, although generally low in volume. As an indicator of the growth in the air freight sector, it is noted that between 1990 and 1999 the overall air cargo volumes at Pearson International Airport increased by an average of 4.5% per annum. The fastest growing sector is between Canada and the eastern United States.

While the international airports in Toronto and Buffalo can be expected to be the major passenger airports in the future, the Hamilton International Airport could play a greater role in the transport of specialized goods, as well as accommodating passenger services to smaller markets.

A significant issue related to air transportation is accessibility to the airports from the road network. Air transit requires efficient ground transportation facilities to link the airports to the final destination for passengers and cargo.

Improved highway connections could substantially improve airport accessibility and use. The proposed

Highway 6 New link between Highway 403 and Hamilton International Airport will provide enhanced access to this facility.

3.3.4 Local and Inter City Transit

Individual local municipalities within the study area operate their own conventional transit and para-transit services. Based upon data extracted from the 1996 Transportation Tomorrow Survey (TTS) data, it has been determined that approximately 2% of trips in Niagara Region and 7% of trips in the City of Hamilton were made by municipal transit. An additional 1% of trips were made using GO Transit in Hamilton.

4 EXISTING TRAVEL CHARACTERISTICS

4.1 Travel Patterns

Trip making characteristics in the Region of Niagara and the City of Hamilton were extracted from the 1996 Transportation Tomorrow Survey (TTS). Some of the notable characteristics from TTS are summarized in exhibits contained in **Appendix D.**

The characteristics of trip making on the Bridges was derived from two sources:

- The 1991 IMC Bridge Crossing Survey
- The 2000 Passenger Vehicle Survey (Cole Sherman, August 2000)

The notable characteristics are summarized in exhibits contained in **Appendix D.**

The travel characteristics for the commercial vehicle traffic were extracted from the 1995 and 2000 (preliminary) Commercial Vehicle Survey. The notable characteristics are, again, summarized in **Appendix D**.

4.2 Roadways

The existing traffic conditions were reviewed for the major facilities in the Peninsula: QEW, Highway 406, Highway 403, Highway 405, Highway 420 and Highway 3.

4.2.1 Queen Elizabeth Way

The QEW is the only east west freeway connecting the Niagara Frontier to the GTA. The sectional characteristics (volume and growth) of the highway are shown in **Appendix D**.

An hourly profile of the daily 2-way volume the QEW at Fruitland Road over a typical day ca n be found in **Appendix D**.

Auto volumes on a typical day are highest during the p.m. peak hour. Volumes remain high between 6:00 a.m. and 7:00 p.m. Truck volumes remain fairly consistent over the day, but do peak mid-day. The truck volume during the off peak periods represents between 15% and 40% of the volume on the QEW. During the peak periods, the truck volume represents 15% to 20% of the hourly volume.

4.2.2 Highway 406

Highway 406 is a 4-lane highway from the QEW to Beaverdams Road and is a 2 lane rural highway from there to East Main Street. The average daily traffic on Highway 406 ranges from 30,000 to 45,000 in the north and from 12,000 to 25,000 in the south.

4.2.3 Highway 405

Highway 405 is a 4-lane divided highway that connects the Queenston Lewiston Bridge to the QEW. The average daily volume on Highway 405 is 15,000 vehicles.

4.2.4 Highway 420

Highway 420 is a 4 lane divided highway that links the City of Niagara Falls (Rainbow Bridge) to the QEW. The average daily volume on Highway 420 varies, by section, between 15,000 and 36,000 vehicles.

4.2.5 Highway 3

Highway 3 is a 2 lane east-west rural arterial/highway that traverses the southern part of the Peninsula, connecting Fort Erie to/through Haldimand County to southwestern Ontario. The average daily volume on Highway 3 ranges from 7,500 to 11,200 in the east and 4,500 - 7,500 in the west.

4.2.6 Highway 403

Highway 403 is an east-west divided highway that connects the QEW northeast of Hamilton to the Highway 401 east of London via Hamilton, Ancaster and Brantford. Highway 403 has a 6-lane cross section to Main Street in Hamilton and a 4-lane cross section from Main Street to the west. Highway 403 through Hamilton has an average daily volume of 90,000 to 115,500 vehicles on the 6-lane section and 40,000 to 50,000 on the 4 lane section.

4.2.7 Bridges

The Peace Bridge is a 3-lane bridge crossing the Niagara River connecting the QEW in Fort Erie, Ontario to I 90 in Buffalo, New York. In 2000, there were 8.2 million vehicle crossings, including 1.5 million trucks. This represents an average daily volume of approximately 23,500 vehicles.

The Rainbow Bridge is a 4-lane bridge crossing the Niagara River connecting Highway 420 and local roads in the tourist district of Niagara Falls, Ontario to local roads in Niagara Falls, New York. In 2000, there were 4.5 million vehicle crossings. Trucks are prohibited on this bridge. This represents an average daily volume of approximately 12,500 vehicles.

The Whirlpool Bridge is a 2-lane bridge crossing the Niagara River connecting local municipal roads in the business district of Niagara Falls, Ontario to local roads in Niagara Falls, New York. In 2000, there were 0.8 million vehicle crossings. Trucks are prohibited on this bridge. This represents an average daily volume of approximately 2,500 vehicles.

The Queenston-Lewiston Bridge is a 4-lane structure crossing the Niagara River to connect Highway 405 (north of Niagara Falls, Ontario) to Highway I190 (Town of Niagara , New York). In 2000, there were 4.6 million vehicle crossings, including 1 million trucks. This represents an average daily volume of approximately 12,600.

4.2.8 Summary

From the perspective of east-west travel through the Niagara Peninsula, the QEW and Highway 3 are the only continuous highway routes. The QEW is the only high order facility that serves travel between the GTA and the Niagara Frontier.

With respect to the bridges, the capacity of each bridge is not constrained today by the physical capacity of the structures (4-lane facilities under free-flow conditions can service in excess of 25,000 vehicles per day, depending on the daily profile) but by the processing times at the customs booths. The future capacity requirements of the bridges are dependent on the ability of the customs and immigration staff to quickly and efficiently process the crossings.

5 TRAVEL FORECASTS

5.1 Approach

The objective of the demand forecasting component of the study was to determine the future travel demand associated with growth in:

- Population and employment in the analysis area;
- Tourist travel in and through the analysis area; and
- Commercial vehicle traffic in and through the analysis area.

A traffic forecasting model was developed to estimate weekday p.m. peak hour travel for the base year 2000 and horizon years 2011, 2021 and 2031.

The p.m. peak hour traffic volumes are then converted into Design Hour Volumes (DHV) for highway deficiency analysis.

5.2 Model Development

To ensure consistency between several concurrent ministry transportation studies, the ministry requested that the various consultant teams develop a modelling approach based on common land use, road network, p.m. peak hour trip data and assumptions regarding future growth in commuter, tourism and commercial traffic growth. Each consultant team retained the ability to test different land use scenarios, traffic growth rates, road network options, etc.

The Ministry of Transportation, Durham, Toronto, York, Halton and Hamilton utilize the EMME/2 modelling package as the basis for traffic forecasting in the Greater Toronto Area (GTA). The Regional Municipality of Niagara uses the System II modelling package. In order to retain consistency with the GTA municipalities and the concurrent ministry studies in central Ontario, the EMME/2 traffic model was modified to include Niagara Region.

The most recent data sources used as the basis for model development including:

- 1996 Transportation Tomorrow Survey (TTS) which provides weekday travel data for the Niagara, Hamilton and GTA region;
- 1995 and 1999 Commercial Vehicle Survey (CVS) which provides daily truck data at selected highway locations;
- 2000 Niagara Bridge Passenger Vehicle Survey which provides weekday and weekend travel data for the four Niagara River bridge crossings; and
- 1999, 2000 MTO and municipal traffic counts.

5.3 Demand Forecasting Process

Consistent with ministry traffic modelling practice a conventional three-step process was used: trip generation, trip distribution and trip assignment.

Trip Generation refers to the number of trips produced by and attracted at a traffic zone level. Trip generation rates are derived through relating work and non-work trips to zonal population and employment. Future growth in population and employment can then be used to generate future year trips to and from traffic zones.

Trip Distribution refers to the origin and destination of trips between traffic zones. Consistent with other ministry studies a Fratar technique is used to forecast future trip patterns. The Fratar procedure assumes that trips between zones will increase in proportion to future growth in population and employment for these zones.

Trip Assignment refers to the allocation of the trips to a road network. The road network consists of a large number of links (roads) and nodes (interchanges/intersections) connected to the traffic zones. The EMME/2 model uses a capacity restrained technique to assign auto and truck trips to the road network. In this process, the capacity of the road constrains the number of vehicles on the basis of travel time i.e., vehicles will change routes to minimize travel time. The network assignment converges to a "user equilibrium" where no vehicle can improve travel time by changing its route between traffic zones.

The model developed is for auto and inter-city truck trips only as there is a small number of non-auto (rail and bus trips) in the study area. This model, therefore, assumes in the base case that the future transit mode share is same as the current transit mode share. In view of declining transit use, this assumption may in fact be optimistic where transit service exists.

For the purpose of testing transportation alternatives based on new services (e.g., commuter rail) or enhanced services (e.g., express bus), passenger demand is estimated, converted into auto passengers and then related to auto vehicles. The forecast auto demand is then reduced by the corresponding estimate of auto users diverted to the alternative mode.

Baseline forecasts were developed based on four component trip types/markets:

- Population and employment based trips (home based) for work, school and discretionary trip purposes;
- Tourist/recreation trips (non-home based)
  - To/from Niagara Falls
  - To/from international bridges; and
- Commercial Vehicle trips – primarily trucks using inter-city highway network.

5.4 Road Network

The road and highway network created and updated on a regular basis by the University of Toronto Data Management Group (DMG) is the basis for modelling in the GTA. The network encompasses the GTA municipalities of Durham, Toronto, York, Peel, Halton, as well as Hamilton. Municipalities external to this area have previously been represented as single point "gateways".

For the purposes of this study, the road network and traffic model were expanded to include Niagara

Region. In view of the incompatibility between MTO's EMME/2 and Niagara Region's System II transportation modelling packages, it was necessary to convert the Niagara Region road network and traffic zone system into EMME/2. In addition, a coarse road network and zone system was created for the Buffalo – Niagara Falls, N.Y. area across the Niagara River.

The EMME/2 model therefore extends from Buffalo through Niagara and Hamilton into the GTA. In view of the extent of this road network and the number of traffic zones, it was necessary to aggregate some traffic zones in Niagara Region. The detail of the road system – provincial, regional and major local roads, however, is retained. The road network and zone conversion tables are contained in **Appendix E**.

Horizon year road networks were created using the base network and adding committed or programmed road improvements. These include improvements currently on MTO's 5-year capital plan and municipal 10 and 20 year capital works programs. A listing of the improvements is contained in **Appendix E**. These proposed improvements were reviewed and approved by Project Team members. The major provincial highway improvements in the analysis area are the following:

- QEW
  - 6 to 8 lanes through Halton
  - 4 to 6 lanes from Highway 405 to Mountain Road (Sand Plant Hill);
- Highway 403
  - 6 to 8 lanes from Freeman Interchange to Highway 6;
- Highway 406
  - Extension to East Main Street; and
- Highway 407
  - 6 lanes from Highway 403 to Freeman Interchange.

5.5 Design Hour Volume

Forecasts for the weekday p.m. peak hour were converted into Design Hour Volumes (DHV) for each provincial highway link in the analysis area. Standard ministry practice is to base the DHV on the 30th highest hour of the year. Thus, a highway is not designed for the maximum observed volume and then underutilized for most hours of the year.

A review of annual hourly counts for the QEW reveals that a large number of the highest hours occur on summer weekdays and weekends. For the purposes of this study, the 115th highest hour of the year was used as the basis for the DHV – a more conservative estimate than the typical 30th highest hourly volume. This is consistent with previous ministry studies in Niagara Region.

For routes that serve largely commuter trips (e.g., Highway 406), the DHV is very close to the modelled weekday p.m. peak hour. For routes with a high proportion of seasonal tourist and recreational travel (e.g., the QEW), the DHV is observed to be 25% higher than the DHV.

Annual hourly count data for 1999 for the QEW, Highway 406 and Highway 403 were reviewed and a profile of the hourly data for each station was developed. The 30th and 115th hour were identified in

order to develop an understanding of where the weekday p.m. peak hour forecast volumes will fit relative to the design hour. These profiles are provided in **Appendix F**.

5.6 Model Validation

The traffic model was developed using p.m. peak hour trip data from various data sources from different time periods and, hence, had to be consolidated and then factored to represent the base year 2000. The road network is a detailed system of links with specific characteristics (e.g., lanes, posted speeds, capacities) and connections to traffic zones.

It is therefore necessary to validate the model through a comparison of the simulated model traffic volumes against observed traffic count data. For this purpose a number of "screenlines" were established comparing modelled to observed traffic volumes and capacity. A "screenline" is an imaginary or real boundary that defines a broad corridor through which traffic flows. The screenline may represent one road link or several road links.

Thirteen major screenlines were used to assess model validity and analyse east-west travel through the analysis area. The screenlines, listed below, are illustrated in a map provided in **Appendix G**.

- Screenline 1 - Hamilton, West Boundary;
- Screenline 2 - Hamilton, East Boundary;
- Screenline 3 - Hamilton, Escarpment;
- Screenline 4 - Hamilton, North Boundary;
- Screenline 5 - Hamilton, South Boundary;
- Screenline 6 - Hamilton, North of Highway 5;
- Screenline 7 - Niagara, Niagara River;
- Screenline 8 - Niagara Falls, East of QEW;
- Screenline 9 - Niagara Falls, West of QEW;
- Screenline 10 - St Catharines, South of QEW;
- Screenline 11 - Niagara, Welland Canal;
- Screenline 12 - Niagara, 15 Mile Creek/West Pelham Boundary; and
- Screenline 13 - Niagara, Escarpment.
- Screenline 14 - South Gateway

Screenline and link summary tables, contained in **Appendix G**, present the final model calibration results (model versus count).

It was generally found that the model was calibrated within acceptable limits at a screenline level of detail. Under 10% difference between observed and modelled volumes was found for nine of the screenlines and under 20% difference for three of the screenlines. For the remaining two screenlines where the difference was greater than 20%, the crossing volume was low and therefore the actual volume difference was not significant or the difference was found in the off peak/non critical direction.

It was concluded that the model could be used as a tool to forecast future traffic volumes, examine highway deficiencies and test a range of roadway improvement options.

5.7 Travel Demand

Future demand is dependent on a variety of socio-economic factors. The various components of the area traffic are dependent on different aspects of the economy and demographics of the analysis area. Growth in the area traffic was segregated by the different markets in the volume flow: population and employment based auto trips, tourist/recreation based auto trips, and international/interregional commercial vehicles.

Population and Employment Based Trips

Existing population and employment levels were used to determine production and attraction rates. These rates were applied to forecast population and employment levels by traffic zone to produce home based trip ends (to/from) by traffic zone. Home-based trip generation and distribution was developed based on data from the 1996 Transportation Tomorrow Survey and applied to the land uses.

Growth in the population and employment based trips is dependent on the growth in area land use assumptions for population and employment. As described earlier, land use forecasts for the area were developed based on current Official Plan targets. Based on these projections an overall growth rate of 1.2% was calculated for home based trips.

Tourist/recreation trips

Tourist based trips were developed based on information extracted from the August 2000 Passenger Vehicle Survey of the International Bridge Traffic by the Region of Niagara and the 1990 International Bridge Survey. These surveys, in conjunction with visitation information, were used to identify the tourist component of traffic volumes in the Region of Niagara and at the international bridges.

Tourist based trips were divided into two types: i) to/from Niagara Falls and ii) to/from the Niagara Frontier International Bridges. The growth in these components of traffic was determined based on a regression analysis of past trends in volume and visitation against growth in population and variation in the value of the Canadian dollar relative to the American dollar. The result was a range in growth projections dependent on a range of anticipated economic conditions. A summary of the results of the regression analysis performed to determine international traffic growth is provided in **Appendix H**.

In summary, the following growth rates were developed for tourist activity:

- Auto traffic(2021/2031) on the Niagara Bridges
  - The high scenario (low value of Canadian dollar) represents a growth of 2.7%/3.4% per annum.
  - The low scenario (high value of Canadian dollar) represents a growth of 1.6%/1.9% per annum.

- Visitation (2021/2031)
  - The base visitation scenario (7 million new visitors) represents a growth of 0.7% per annum (for both horizons).
  - The high visitation scenario (25 million new visitors) represents a growth of 3.6%/4.1% per annum.

- Visitation to Niagara Falls
  - Existing visitation is split 66% U.S. versus 34% Canadian. In the future, the trend is expected to shift in favour of the Canadian share because of the low growth of population and employment in the adjacent region on the U.S. side. While U.S. levels are likely to hold steady, the Canadian levels are expected to increase significantly which would result in a change in the distribution. It is estimated that in the future, the distribution will be more equal between U.S. and Canadian visitors (i.e. 50/50).

Commercial Vehicle Trips

The commercial vehicle forecasts were developed from information and relationships from the following data sources:

- 1995 MTO Commercial Vehicle Survey
- 1999 MTO Commercial Vehicle Survey (Bridge Crossing Data Only).
- 1999 - 2000 Traffic Counts.
- Niagara Falls Bridge Commission (Queenston-Lewiston Bridge).
- NFBC - Living Plan (2000).
- Buffalo Fort Erie Bridge Authority (Peace Bridge).
- MTO permanent count station (PCS) data on the QEW at Winona and Fruitland.
- Previous Studies.
  - Niagara Frontier Gateway Study.
  - Peace Bridge Environmental Assessment Capacity Expansion (1996).

The 1995 MTO Commercial Vehicle Survey (CVS) database was obtained from MTO and reviewed with respect to:

- Base year traffic flows and origin-destination patterns.
- Assessment of "just-in-time" deliveries.
- Future traffic forecasts.

A twenty-eight district aggregation was developed based on MTO CVS vehicle zones and is representative of 1995, 2006 and 2021 trip tables. Traffic data from the 1999-2000 MTO CVS was used to establish the year 2000 commercial vehicle control totals by corridor. The growth in traffic by corridor provided trip controls that were used to fratar the 1995 daily commercial vehicle trip table to year 2000 conditions.

Commercial vehicles have shown significant growth on the international bridges over the past 10 years. The future for truck volumes, size and commodity types, are hard to predict beyond the next 5 years as this market is very sensitive to the economy and the technologies of the day. Regression analysis was performed to determine the relationship between truck volumes and the value of the Canadian dollar and the Canadian Gross Domestic Product (GPD). These indicators were used as surrogates for the prevailing economic climate. Tests were performed for varying dollar levels and varying GDP forecasts. The results from regression analysis performed to determine the truck growth are provided in **Appendix H**.

In summary, the resulting growth rates were as follows:

- Low growth scenario:

  - Now to 2021 represented by a growth of 2.4 % per annum.
  - 2021 to 2031 represented by a growth of 2.6% per annum.

- High growth scenario:
  - Now to 2031 represented by a growth of 3.4 % per annum.
  - 2021 to 2031 represented by a growth of 3.2% per annum.

The magnitude of the difference between scenarios is considered to be relatively small. A growth rate of 3% per year was assumed as a "medium" growth scenario.

Summary

There are several possible future socio-economic conditions which will have an effect on the traffic volumes across the International bridges and in the QEW corridor:

- base population and employment versus hinterland reallocation;
- low versus high visitation levels in Niagara Falls; and
- low versus high international bridge crossings – for both auto and commercial vehicle modes.

For the purpose of identifying the long term needs 2021 and 2031 low and high bridge crossing volume were tested with the base population (accepted Official Plan expectations) and low visitation to Niagara Falls (consistent with expected employment levels and currently planned infrastructure).

In the assessment of the network alternatives, documented later in Section 7.0 of this report, only the high bridge crossing scenario was applied. The relative difference between the high and low crossing scenarios was not considered significant in the assessment of the alternatives.

The alternative land use and high visitation levels were tested only as sensitivity tests.

5.7.1 Assignment

The Emme/2 model uses a capacity constrained equilibrium assignment algorithm, meaning the assignment converges to a “user-equilibrium” where no one user can improve their travel time by changing their route. This approach provides the ability to assess the diversion and service impacts that new or improved network infrastructure has on both a link and network basis.

5.7.2 Non-Auto Modes

The modelling process used is an assignment of the auto mode only. The demand flows are expressed as auto volumes only. Inherent in the level of auto trip making are non-auto modes: truck, bus, rail, cycling, and walk modes. Changes to the mode split, or increases in non-auto share of the trip making, are reflected in the auto trip demand matrices through a comparable reduction in the auto use.

In the case of trucks/commercial vehicles, an after-assignment adjustment of the road sectional volume is made based on the known information related to the commercial vehicle component of the link volume (i.e. percentage).

5.8 Results

Auto assignments were prepared using the EMME/2 model for each of the four horizon years: 2000, 2011, 2021 and 2031 under "base network" conditions. Volume plots and summaries were prepared for the screenlines and for the critical links in the analysis area. Volume plots for the base network are contained in **Appendix I.**

6 IDENTIFICATION AND ASSESSMENT OF TRANSPORTATION PROBLEMS

The purpose of this component of the study is to identify the problem areas on the transportation system resulting from the travel demands generated by the process defined in the previous chapter, ie. the model and associated land use/growth scenarios inputs. An extensive review of the travel demands was undertaken to identify existing problems and trends that have been established in the major travel corridors and across the critical screenlines.

To assess the performance of the network, several criteria or measures of performance were assessed. These criteria/measures were as follows:

- Level of Service – critical screenline and significant facilities
- System Travel – vehicle-kilometres of travel on arterial and highway networks
- System Travel Time – average vehicle travel time on arterial and highway networks
- System Speed – average vehicle speed on arterial and highway networks
- System Congestion – network kilometres over capacity

Typically, the Level of Service measures the adequacy of the road network to serve travel demand. Level of Service (LOS) is a measure used to describe the operating characteristics of a roadway section over a one hour period during peak usage. LOS is typically related to the ability of the roadway to accommodate the volume load during the peak period use. The roadway LOS's has been grouped into categories and are expressed as a range of values A through F as follows:

Level of Service	Operating Characteristics
A-C	Free flow operation; uncongested
D	Acceptable operation, but approaching unstable operating conditions
E-F	Unacceptable; congested

The design hour volumes for the provincial links in the analysis area were evaluated based on the calculated Level of Service. Level of Service E is considered by MTO to be the threshold at which facilities are identified as being capacity deficient. Because of the unique role of the QEW corridor relative to the significant tourist and commercial vehicle components and the associated peaking characteristics of the QEW, the remaining criteria were used to assess of the overall network performance and the relative changes that occur over time and network conditions.

In Section 5.7 of this report, varying growth rates were identified for the visitation and international bridges based on various socio-economic variables. Two possible conditions were developed:

- Low Scenario – Low visitation to Niagara Falls, low growth in international bridge crossings
- High Scenario – Low visitation to Niagara Falls, high growth in international bridge crossings

For the 2011, the low scenario was used to forecast volumes. For the 2021 and 2031 horizon years, volume forecasts were prepared based on the both the low and high scenarios. In the shorter term, significant changes in the economic environment are not expected to immediately impact existing trends. In the longer term, the trends in the socio-economic environment are not as predictable and therefore a range of growth potential for the bridge was used.

6.1 Existing Transportation Deficiencies and Effects

In order to identify existing transportation deficiencies using the model, volume-to-capacity (v/c) ratios were calculated for the significant highway links in the network.

A summary of the volume to capacity (v/c) ratios for the significant highway links in the analysis area is provided in ***Table 6.1***

Table 6.1
Year 2000
Critical Link – Level of Service Summary

Facility	Description / Limits	Low Scenario
QEW	8-lanes from Hwy 403 to Burlington Street (Burlington Bay Skyway)	D
	6-lanes from Burlington Street to Highway 406	C
	4-lanes from Highway 406 to Niagara Street (through St Catharines)	D
	6-lanes from Niagara Street to Highway 405	D
	4-lanes from Mountain Road to Highway 420	B
Highway 406	4-lane section between Highway 58 and Geneva Street	D
	4-lane section between Highway 20 and Highway 58	B
Highway 403	6-lane section between Aberdeen Road and QEW	D
International Bridges	Queenston-Lewiston	A
	Whirlpool Bridge	A
	Rainbow Bridge	A
	Peace Bridge	C

More detailed summary analysis is contained in **Appendix J**.

The 2000 Level of Service analysis for the provincial Highway system serving the Hamilton and Niagara Area indicates the following:

- QEW
  - The 8-lane QEW from Hwy 403 to Burlington Street (Burlington Bay Skyway) is operating at LOS D.
  - The 4-lane QEW from Highway 406 to Niagara Street (through St Catharines) is currently operating at LOS D;

- Highway 406
  - The 4-lane section between Highway 58 and Geneva Street is operating at LOS D;

- Highway 403
  - The 4-lane section between Aberdeen Road and Highway 6 is operating at LOS D;

- International Bridges
  - The existing bridge capacities are adequate to meet existing demands at all four bridges. The delays experienced at the bridges are a result of the processing capacities of the customs and immigration.

The following is noted regarding the performance of the network:

- Average speed in the network is 56.4 km/h. Average speed on the Provincial facilities is 64.3 km/h in Niagara and 68.4 km/h on the Provincial facilities in Hamilton;

- 3.2% of the road network in Hamilton and Niagara operates at LOS E-F. The proportion of Provincial facilities operating at LOS E-F is 8.5% in Niagara and 3.7 % in Hamilton.

6.2 Year 2011 Transportation Deficiencies and Effects

A summary of the volume to capacity (v/c) ratios for the significant highway links in the analysis area is provided in ***Table 6.2***

Table 6.2
Year 2011
Critical Link – Level of Service Summary

Facility	Description / Limits	Low Scenario
QEW	8-lanes from Hwy 403 to Burlington Street (Burlington Bay Skyway)	E-F
	6-lanes from Burlington Street to Highway 406	E-F
	6-lanes from Highway 406 to Niagara Street (through St Catharines)	E-F
	6-lanes from Niagara Street to Highway 405	E-F
	4-lanes from Mountain Road to Highway 420	C
Highway 406	4-lane section between Highway 58 and Geneva Street	E-F
	4-lane section between Highway 20 and Highway 58	C
Highway 403	6-lane section between Aberdeen Road and QEW	E-F
International Bridges [1]	Queenston-Lewiston	A
	Whirlpool Bridge	A
	Rainbow Bridge	A
	Peace Bridge (Twinning of Peace Bridge Assumed)	A

[1] Bridge LOS based on auto plus truck volume and operating capacity of bridge lanes. LOS calculations in screenline summary tables (Appendix J) show slightly worse LOS because planning level auto capacities assumed.

More detailed summary analysis is contained in **Appendix J**.

The level of service analysis for Year 2011 indicates the following:

- QEW
  - The 6-lane QEW from Hwy 403 to Burlington Street (Burlington Bay Skyway) is expected to operate at LOS E-F;
  - A 6-lane QEW from Burlington Street to Highway 406 is expected to operate at LOS E-F;
  - A 6-lane QEW from Highway 406 to Niagara Street (through St Catharines) is expected to operate at LOS E-F;
  - A 6-lane QEW from Niagara Street to Highway 405 is expected to operate at LOS E-F;

- Highway 406
  - The 4-lane section between Highway 58 and Geneva Street is expected to operate at LOS E-F;

- Highway 403

- The 6-lane section between Aberdeen Road and QEW is expected to operate at LOS E-F.

6.3 Year 2021 Transportation Deficiencies and Effects

A summary of the volume to capacity (v/c) ratios for the significant highway links in the analysis area is provided in ***Table 6.3***

Table 6.3
Year 2021
Critical Link – Level of Service Summary

Facility	Description / Limits	Low Scenario	High Scenario
QEW	8-lanes from Hwy 403 to Burlington Street (Burlington Bay Skyway)	E-F	E-F
	6-lanes from Burlington Street to Highway 406	E-F	E-F
	6-lanes from Highway 406 to Niagara Street (through St Catharines)	E-F	E-F
	6-lanes from Niagara Street to Highway 405	E-F	E-F
	4-lanes from Mountain Road to Highway 420	D	D
Highway 406	4-lane section between Highway 58 and Geneva Street	E-F	E-F
	4-lane section between Highway 20 and Highway 58	D	D
Highway 403	6-lane section between Aberdeen Road and QEW	E-F	E-F
International Bridges [1]	Queenston-Lewiston	C	D
	Whirlpool Bridge	A	A
	Rainbow Bridge	B	B
	Peace Bridge (Twinning of Peace Bridge Assumed)	B	C

[1] Bridge LOS based on auto plus truck volume and operating capacity of bridge lanes. LOS calculations in screenlinesummary tables (Appendix J) show slightly worse LOS because planning level auto capacities assumed.

More detailed summary analysis is contained in **Appendix J**.

The level of service analysis for Year 2021 indicates the following:

- QEW
  - The 8-lane QEW from Hwy 403 to Burlington Street (Burlington Bay Skyway) is expected to operate at LOS E-F;
  - A 6-lane QEW from Burlington Street to Highway 406 is expected to operate at LOS E-F;
  - A 6-lane QEW from Highway 406 to Niagara Street (through St Catharines) is expected to operate at LOS E-F;
  - A 6-lane QEW from Niagara Street to Highway 405 is expected to operate at LOS E-F;

- Highway 406
  - The 4-lane section between Highway 58 and Geneva Street is expected to operate at LOS E-F;

- Highway 403
  - The 6-lane section between Aberdeen Road and QEW is expected to operate at LOS E-F.

From a network perspective, the following changes in system performance by 2021 were noted:

- Average system speed decreased by 10%, including a decrease of 2.6% on provincial facilities in Niagara and 21.2 % in Hamilton;

- 6.2% of the road network in Hamilton and Niagara operates at LOS E-F. The proportion of Provincial facilities operating at LOS E-F is 7.9% in Niagara and 12.8% in Hamilton.

6.4 Year 2031 Transportation Deficiencies and Effects

A summary of the volume to capacity (v/c) ratios for the significant highway links in the analysis area is provided in ***Table 6.4***

Table 6.4
Year 2031
Critical Link – Level of Service Summary

Facility	Description / Limits	Low Scenario	High Scenario
QEW	8-lanes from Hwy 403 to Burlington Street (Burlington Bay Skyway)	E-F	E-F
	6-lanes from Burlington Street to Highway 406	E-F	E-F
	6-lanes from Highway 406 to Niagara Street (through St Catharines)	E-F	E-F
	6-lanes from Niagara Street to Highway 405	E-F	E-F
	4-lanes from Mountain Road to Highway 420	E-F	E-F
Highway 406	4-lane section between Highway 58 and Geneva Street	E-F	E-F
	4-lane section between Highway 20 and Highway 58	E-F	E-F
Highway 403	6-lane section between Aberdeen Road and QEW	E-F	E-F
International Bridges [1]	Queenston-Lewiston	C	E-F
	Whirlpool Bridge	A	A
	Rainbow Bridge	B	C
	Peace Bridge (Twinning of Peace Bridge Assumed)	B	C

[1] Bridge LOS based on auto plus truck volume and operating capacity of bridge lanes. LOS calculations in screenline summary tables (Appendix J) show slightly worse LOS because planning level auto capacities assumed.

More detailed summary analysis is contained in **Appendix J**.

The level of service analysis for Year 2031 indicates the following:

- QEW
  - The 8-lane QEW from Hwy 403 to Burlington Street (Burlington Bay Skyway) is expected to operate at LOS E-F;
  - A 6-lane QEW from Burlington Street to Highway 406 is expected to operate at LOS E-F;
  - A 6-lane QEW from Highway 406 to Niagara Street (through St Catharines) is expected to operate at LOS E-F;
  - A 6-lane QEW from Niagara Street to Highway 405 is expected to operate at LOS E-F;
  - A 4-lane QEW from Mountain Road to Highway 420 is expected to operate at LOS E-F.

- Highway 406
  - The 4-lane section between Highway 58 and Geneva Street is expected to operate at LOS E-F;
  - The 4-lane section between Highway 20 and Highway 58 is expected to operate at LOS E-F.

- Highway 403
  - The 6-lane section between Aberdeen Road and QEW is expected to operate at LOS E-F.

From a network perspective, the following changes in system performance by 2031 were noted:

- Average system speed decreased by 15%, including a decrease of 7.9% on provincial facilities in Niagara and 21.2 % in Hamilton;

- 11.7% of the road network in Hamilton and Niagara operates at LOS E-F. The proportion of Provincial facilities operating at LOS E-F is 11.8% in Niagara and 16.4% in Hamilton.

6.5 Conclusions

The following conclusions were reached based on the analysis of the existing and future base network conditions:

Existing constraints

- There are existing capacity constraints on the QEW between the Freeman Interchange in Burlington and the Burlington Bay Skyway and on the 4-lane section through St. Catharines.

Near term capacity problems will continue or develop as follows:

- Burlington Bay Skyway to Freeman Interchange.
- 6-lane QEW through St. Catharines.
- Highway 403 between QEW and the Lincoln Alexander Parkway (3 lanes W/B, 2 lanes E/B).
- 4 lane Highway 406 between Highway 20 and Geneva Street.

Additional capacity problems will occur in the longer terms as follows:

- 6-lane QEW between Burlington Street in Hamilton and Highway 406 in St. Catharines.
- 4 lane QEW between Mountain Road and Highway 420 in Niagara Falls.

International Bridges

- Queenston-Lewiston Bridge - the existing bridge capacity is adequate to serve the forecast demand to 2030. In the longer term, the bridge is approaching capacity;
- Whirlpool Bridge – the auto processing capacity appears to be adequate to meet the future average weekdays demands;
- Rainbow Bridge – Without consideration for the processing capacities of the bridge plazas, the Rainbow Bridge has the theoretical capacity to serve the forecast demands. While existing processing capacity is deficient at the plazas, planned improvements (additional booths) on the Canadian side will eliminate the deficiency in the westbound direction. But not the eastbound direction;
- Peace Bridge – planned improvements to the Peace Bridge (widen to 6 lanes) will provide adequate capacity to serve the long-term demands. Again, processing capabilities remain the capacity constraint.

Today, there are capacity constraints on the QEW during the design hour between the Burlington Bay Skyway and St Catharines. The widening of the QEW from 4 to 6 lanes through St Catharines would provide some short term relief to this problem. Additional capacity in the QEW corridor is required in the near term (i.e. by 2011).

In considering the opportunities for additional capacity in the QEW corridor through Niagara Region, it is important to recognize the capacity constraints in the Hamilton highway network, especially Highway 403, the QEW Burlington Bay Skyway and the Freeman Interchange.

With the planned improvements at the Peace Bridge, the capacity of the four bridge crossings to accommodate international travel demand to/from the Niagara Peninsula will be adequate to the year 2031. Travel will be constrained by the processing capacity of customs.

The current and anticipated transportation issues are depicted in **Appendix J.**

7 NETWORK ANALYSIS

Based on an assessment of the forecasts traffic conditions in the analysis area, it is concluded that additional capacity in the QEW corridor is required in the near term (i.e. by 2011). An evaluation of the strategic alternatives to accommodating demand has concluded that alternative modes and travel demand management will not be sufficient to address these deficiencies. Therefore, alternative capacity in the form of additional roadway infrastructure must be considered.

The following section provides an assessment of the roadway alternatives from a transportation demand perspective.

7.1 Alternatives

The assessment and evaluation of transportation alternatives revealed that a road-based solution be carried forward for further analysis to determine the specific improvements that may be required within the analysis area. In identifying a "long list" of potential roadway alternatives, the following criteria was used:

- The road solution should satisfy long term travel demands through the analysis area; and
- Freeway type standards and capacity would apply, either in upgrading existing facilities or in design of a new corridor.

The following long list of road network alternatives was subsequently identified for assessment and evaluation:

- Mid-Peninsula Corridor - A new Mid-Peninsula Corridor - 5 basic alternatives and 1 sub-alternative were defined on the basis of:
  - road network findings and recommendations from prior transportation studies;
  - Official Plans of the area municipalities; and
  - current transportation and planning perspectives and future outlooks;

- QEW widening
  - QEW widening from Freeman Interchange to Highway 420;
  - QEW widening from Freeman Interchange to Highway 406 plus Highway 420 Extension from the QEW to the Thorold Tunnel; and

- Cross-lake bridge
  - A new "Cross-Lake" Bridge providing a direct connection between Niagara and Toronto.

An exhibit identifying the road network alternatives considered as part of the assessment process is provided in **Appendix K**.

The Mid-Peninsula Corridor alternatives are depicted in **Appendix K**. In simple terms, the corridors were common across much of the escarpment between Hamilton and Niagara but varied according to the east and west terminus locations. In the east the MPC would connect to the QEW at Niagara Falls or further south toward Fort Erie. In the west the MPC would connect to the south or west side of Hamilton via the existing highway network, or to the Highway 407 on the east side.

At present, no formal policy has been defined for the MPC related to its construction as a toll facility. No formal tolling strategy has been identified or proposed. Therefore, the analysis of the alternatives as part of Phase 2 of the EA process (review of the alternatives), and in consideration of the activities undertaken as part of Phase 1 (need and justification), the MPC facility was tested as a no-toll/free facility in each of the alternatives. This provides an assessment of the alternatives from a need, capacity and service perspective without penalty for potential tolls. This is considered an optimum scenario for the role of the facility in the Niagara corridor.

The implications of tolls on the facility demand and the performance of the network was assessed as part of a financial feasibility assessment, which is documented under separate cover. The purpose of the financial feasibility component of the study was to:

- Identify the impacts of tolls on the demand for the MPC and on the QEW;
- Identify an optimal tolling strategy;
- Confirm the financial feasibility of the MPC as a toll facility; and
- Assist in the determination of ownership and partnership opportunities for the facility.

Auto assignments were prepared using the EMME/2 model for 2031 under "alternative network" conditions. Volume summaries were prepared for all of the screenlines and for the critical links in the analysis area. Profiles of peak hour and design hour volume to capacity ratios were developed for the QEW, Highway 403 and Highway 406 corridors. As well, peak hour volume forecasts for the MPC were developed, for conditions with and without QEW improvements.

All of the technical summary output for the future demand analysis is contained in **Appendix K**.

7.2 Sensitivity Testing

Additional analysis was performed for the base and alternative networks in order to provide a greater understanding of the travel flows on the QEW and the MPC.

Volume forecasts were developed for the following networks:

- Alternative C2 – MPC Alternative C with a freeway connection between the MPC and the QEW east of Hamilton in the Mountain Road/Bartlett Road Corridor.
- Alternative G – an extension of Highway 407 from Burlington to Highway 6 in South Hamilton
- MPC Alternative C in combination with a widening of the QEW to 8-lanes between Highway 420 and the Burlington Skyway.
- A widening of the QEW to 10-lanes between Highway 420 and the Burlington Skyway.
- "High-high scenario" - MPC Alternative C with high visitation to Niagara Falls (40 million tourists annually by 2031), high growth on the International Bridges, and the reallocated land use scenario (higher population and employment forecasts for the Region of Niagara and the City of Hamilton).

Select link analysis was performed to provide an understanding of the origins and destinations of users of a specific link. This provides an understanding of the nature (local versus regional, short distance versus long distance) of trips on a specific link at a specific location. Select link output for various scenarios and facilities are provided in **Appendix L**.

In general, the following was noted related to these sensitivity tests:

- For Alternative C2, although the volume forecasts for this facility were significant, it was found that this facility did not contribute significantly to the volume on the MPC. This link served primarily local trips between Hamilton and Niagara and as an access road to the QEW.
- Alternative G showed that the forecast volume on this section of roadway was not dependent on the provision of the section of MPC through the Region of Niagara.
- The alternatives where additional capacity was provided on the QEW showed that there is latent demand for capacity on the QEW that is not necessarily addressed by the provision of capacity in the MPC.
- The volume forecasts for the "high-high" scenario shows increased demand between Niagara and Hamilton. This demand is spread evenly across the east-west corridor and does not show a significant increase in volume on the MPC.
- The select link analysis for Highway 406, Highway 3, Highway 58 and Highway 140 showed that even with an MPC facility, travel on these facilities is dominated by interregional travel, that is travel between Port Colborne, Welland and St Catharines. Although the extension of Highway 406 does provide an opportunity to provide access to St Catharines and Niagara Falls via the south, these volumes are not realized.

8 CONCLUSIONS

Based on the assignment of all of the highways options, the following conclusions are drawn:

- The do nothing option does not address current or future system problem issues;
- The traffic analysis conducted indicated that a combination of roadway improvements in the analysis area might be required to address corridor and specific capacity improvements;
- The MPC alternatives (MPC A and MPC B) terminating east of Hamilton do not resolve congestion issues across the Burlington Bay Skyway and through the Freeman Interchange, and provide no relief to Highway 403 in Hamilton. They rely on connecting to existing north-south links in Hamilton that will be unable to accommodate the additional demand and are unlikely to be expandable (Highway 403 down the escarpment; Red Hill Creek Expressway);
- MPC alternative D does not divert long distance truck and auto traffic from the QEW. The section of the MPC between the QEW and Welland would carry mostly "local" traffic, essentially diverted from the municipal road system. A review of this alternative revealed some deficiencies in the municipal road network between Welland/Pelham and Niagara Falls;
- MPC alternative E does not divert auto and truck traffic from the QEW. In addition, sections of alternative E use existing local roadways through Welland and an existing Welland Canal tunnel crossing, limit the capacity of this section;
- The widening of the QEW in combination with the Highway 420 Extension between Highway 420 in Niagara Falls and the Thorold Tunnel does not resolve future capacity deficiencies or provide relief to the congested freeway network in the Hamilton area; and
- A cross-lake bridge does not address the freeway deficiencies in the Hamilton area, and would not preclude the need for additional east-west freeway capacity in the Niagara Peninsula.
- The results of the analysis indicate that ultimately, beyond 2011, a Mid-Peninsula Corridor provides the best potential to improve the overall road network and meet the transportation system goals. It provides relief to the overall road network by reducing the amount of congestion and increasing average vehicle speeds.
- The assessment also indicates that strategic improvements to the QEW corridor will be necessary in the long term.

Summary graphics describing some of these conclusions are provided in **Appendix M**.

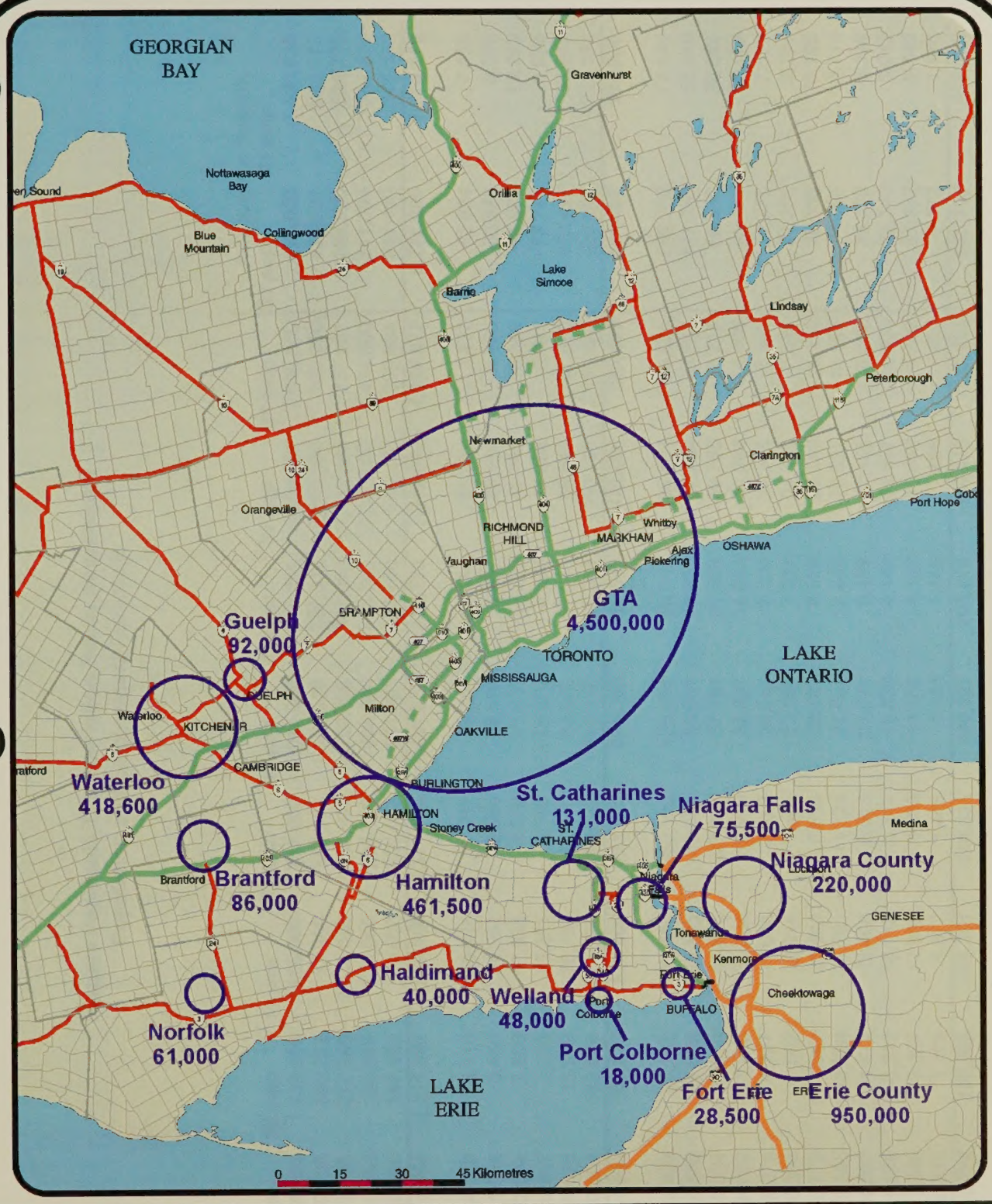
APPENDIX A

Analysis Area

Analysis Area

APPENDIX B

Land Use



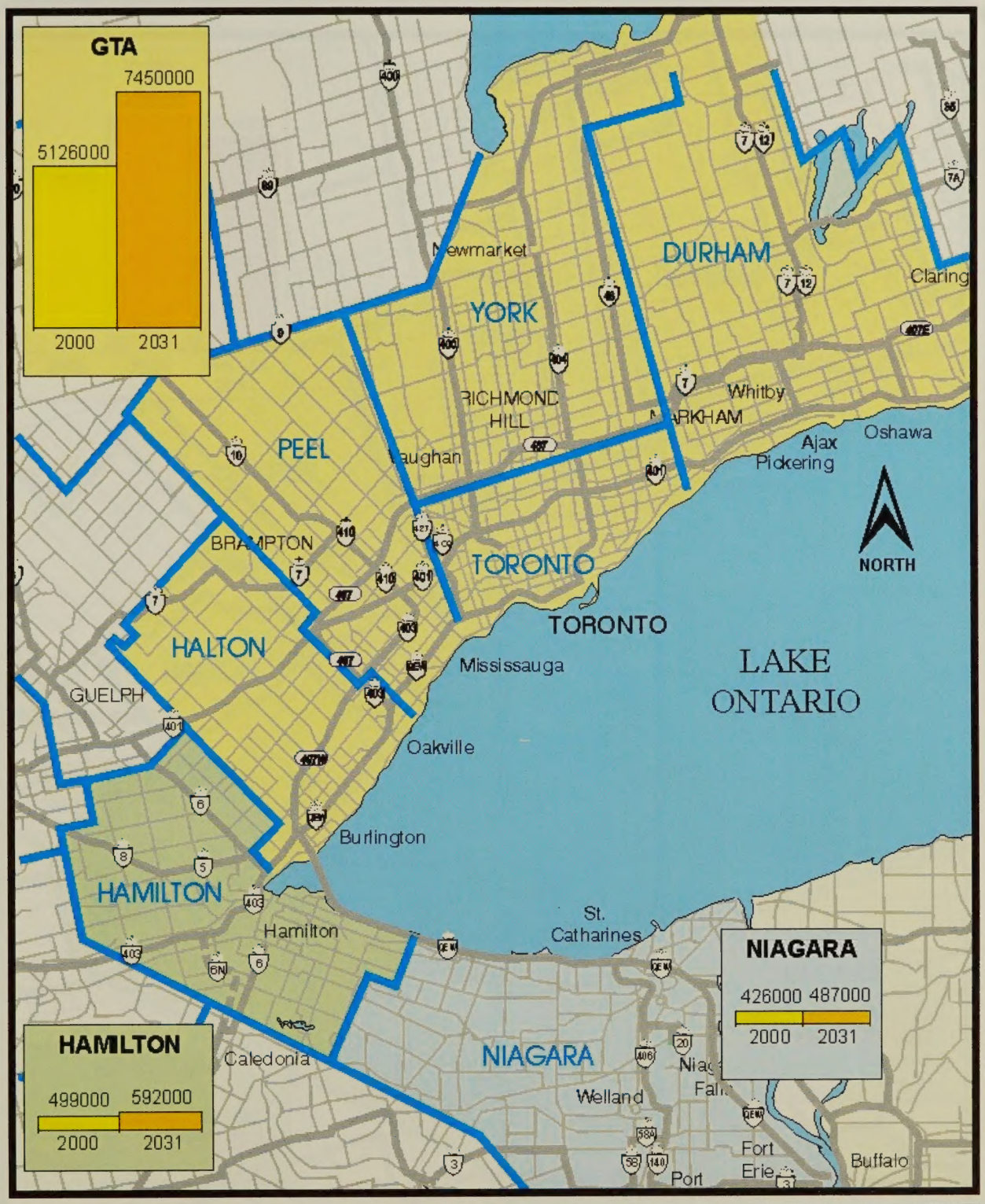
Existing Population Distribution in the Greater Golden Horseshoe Area

Niagara Peninsula Transportation Needs Assessment
Population and Employment Forecasts

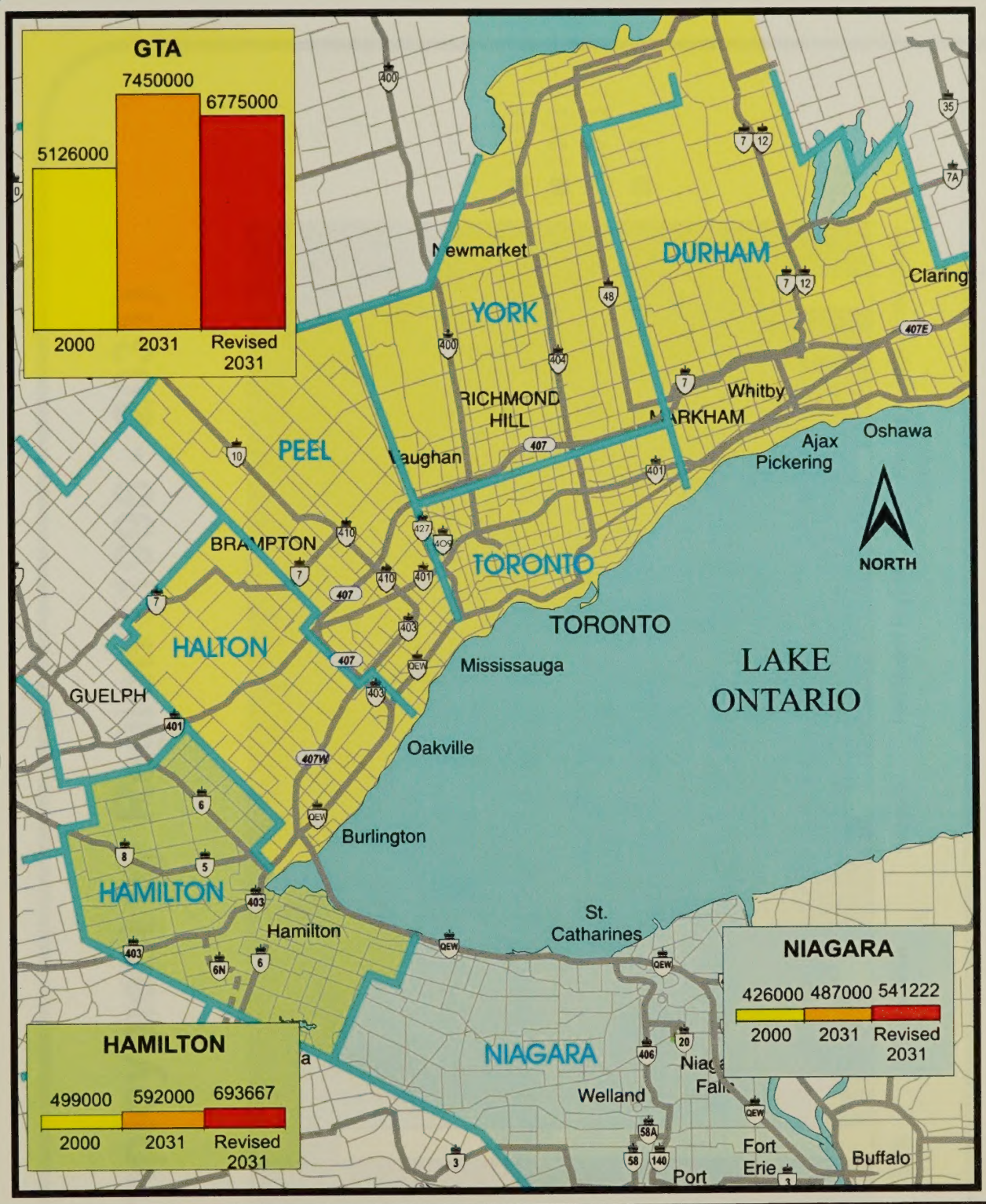
									Re-Allocation Scenario	
	96 pop	***96 emp***	***11 pop***	***11 emp***	***21 pop***	***21 emp***	***31 pop***	***31 emp***	***31 pop***	***31 emp***
Metro	2,305,553	1,259,286	2,855,000	1,616,000	2,915,000	1,719,000	3,000,000	1,835,000	*2,625,000*	*1,605,625*
Peel	812,508	395,222	1,185,000	643,000	1,362,520	750,330	1,400,000	760,000	*1,410,531*	*765,717*
York	567,685	277,945	1,010,000	545,997	1,199,996	647,004	1,359,945	737,987	*1,284,000*	*696,775*
Durham	450,353	156,688	710,000	280,000	963,000	458,000	1,000,000	434,000	*811,000*	*351,974*
Halton	328,265	142,402	500,000	236,942	591,361	283,450	688,907	369,884	*644,469*	*346,025*
GTA Total	***4,464,364***	***2,231,543***	***6,260,000***	***3,321,938***	***7,031,877***	***3,857,785***	***7,448,852***	***4,136,872***	***6,775,000***	***3,766,116***
Flamborough	34,020	8,113	40,935	7,937	54,069	13,356	55,338	13,477	*62,624*	*17,635*
Dundas	21,954	6,465	24,561	8,504	25,516	6,367	26,116	6,425	*30,946*	*9,208*
Ancaster	22,564	5,500	37,865	7,370	41,816	10,250	42,798	10,344	*47,965*	*13,252*
Glanbrook	10,857	2,255	15,351	5,102	15,977	4,995	16,352	5,041	*18,741*	*6,275*
Stoney Creek	52,035	16,959	76,754	23,810	87,003	27,311	89,046	27,560	*100,497*	*34,266*
Hamilton	320,561	169,574	334,134	180,277	342,118	196,261	350,150	198,052	*420,694*	*235,164*
Hamilton Total	***461,991***	***208,866***	***529,600***	***233,000***	***566,500***	***258,540***	***579,800***	***260,900***	***681,467***	***315,800***
St. Catharines	134,423	64,158	134,630	68,390	135,959	68,546	136,624	68,624	*138,203*	*71,940*
Niagara Falls	78,509	29,866	83,325	43,857	93,031	45,657	97,884	46,557	*111,780*	*58,949*
Welland	49,924	20,960	51,893	23,080	57,151	24,506	59,780	25,219	*66,850*	*28,381*
Fort Erie	28,059	11,280	31,724	12,919	35,897	14,083	37,984	14,665	*45,103*	*17,178*
Port Colborne	19,274	6,727	19,644	7,203	20,757	7,300	21,314	7,348	*22,776*	*7,809*
Grimsby	19,894	6,502	22,314	7,408	23,884	7,727	24,669	7,886	*27,286*	*9,391*
Thorold	18,772	7,647	21,841	8,659	25,107	8,959	26,740	9,110	*32,456*	*10,196*
Lincoln	19,155	10,326	23,101	11,729	27,051	12,842	29,027	13,399	*31,508*	*14,715*
Niagara-on-the-Lake	14,067	4,474	18,408	6,025	21,074	6,469	22,407	6,692	*28,389*	*8,338*
Pelham	14,536	3,312	16,719	3,817	18,838	4,142	19,897	4,305	*23,743*	*5,042*
West Lincoln	11,646	3,367	12,890	3,803	14,732	4,136	15,652	4,302	*17,332*	*5,140*
Wainfleet	6,513	1,309	6,872	1,446	7,355	1,449	7,596	1,450	*8,373*	*1,555*
Niagara Total	***414,774***	***169,928***	***443,361***	***198,336***	***480,837***	***205,816***	***499,575***	***209,556***	***553,798***	***238,636***

	POPULATION						
ERIE COUNTY:	1980	1990	2000 (Census)	2000 Int	2010 Int	2020 Int	2025
ALDEN	10,067	10,372	10,470	12,224	12,412	12,850	13,000
AMHERST	108,706	111,711	116,510	126,944	128,893	133,441	135,000
AURORA	13,882	13,433	13,996	14,105	14,321	14,827	15,000
BOSTON	7,687	7,445	7,897	8,463	8,593	8,896	9,000
BRANT	4,079	3,918	3,907	3,761	3,819	3,954	4,000
BUFFALO	357,870	328,123	292,648	300,905	305,525	316,304	320,000
CHEEKTOWAGA	109,442	99,314	94,019	94,033	95,476	98,845	100,000
CLARENCE	18,146	20,041	26,123	27,269	27,688	28,665	29,000
COLDEN	3,128	2,899	3,323	2,821	2,864	2,965	3,000
COLLINS	5,053	6,020	8,307	6,582	6,683	6,919	7,000
CONCORD	8,171	8,387	8,526	9,403	9,548	9,885	10,000
EDEN	7,327	7,416	8,076	7,523	7,638	7,908	8,000
ELMA	10,564	10,355	11,304	12,224	12,412	12,850	13,000
EVANS	17,944	17,478	17,594	18,807	19,095	19,769	20,000
GRAND ISLAND	16,770	17,561	18,621	23,508	23,869	24,711	25,000
HAMBURG	53,270	53,735	56,259	57,830	58,718	60,790	61,500
HOLLAND	3,473	3,572	3,603	4,702	4,774	4,942	5,000
LACKAWANNA	22,701	20,585	19,064	17,866	18,141	18,781	19,000
LANCASTER	30,170	32,181	39,019	42,785	43,442	44,974	45,500
MARILLA	4,861	5,250	5,709	5,642	5,729	5,931	6,000
NEWSTEAD	7,243	7,440	8,414	8,463	8,593	8,896	9,000
NORTH COLLINS	3,778	3,502	3,376	3,761	3,819	3,954	4,000
ORCHARD PARK	24,359	24,632	27,637	30,090	30,552	31,630	32,000
SARDINIA	2,792	2,667	2,692	2,821	2,864	2,965	3,000
TONAWANDA, CITY	18,693	17,284	16,136	14,105	14,321	14,827	15,000
TONAWANDA, TOWN	91,269	82,464	78,155	70,525	71,607	74,134	75,000
WALES	2,817	2,917	3,351	2,821	2,864	2,965	3,000
WEST SENECA	51,210	47,830	50,646	47,016	47,738	49,423	50,000
ERIE CO. TOTAL:	1,015,472	968,532	950,265	977,000	992,000	1,027,000	1,039,000
NIAGARA COUNTY:							
CAMBRIA	4,419	4,779	5,393	5,623	5,874	5,925	6,000
HARTLAND	4,127	3,911	4,165	4,218	4,406	4,444	4,500
LEWISTON	17,140	16,225	17,395	16,402	17,134	17,280	17,500
LOCKPORT, CITY	24,844	24,426	22,279	21,819	22,793	22,988	23,280
LOCKPORT, TOWN	12,942	16,596	19,653	25,043	26,161	26,385	26,720
NEWFANE	9,268	8,996	9,657	9,841	10,280	10,368	10,500
NIAGARA	9,648	9,880	8,978	11,247	11,749	11,849	12,000
NIAGARA FALLS	71,384	61,840	55,593	52,017	54,339	54,803	55,500
NORTH TONAWANDA	35,760	34,989	33,262	33,272	34,757	35,054	35,500
PENDLETON	4,726	5,010	6,050	6,561	6,854	6,912	7,000
PORTER	7,233	7,110	6,920	7,029	7,343	7,406	7,500
ROYALTON	7,764	7,453	7,710	7,498	7,833	7,900	8,000
SOMERSET	2,680	2,655	2,865	2,812	2,937	2,962	3,000
WHEATFIELD	9,609	11,125	14,086	14,996	15,665	15,799	16,000
WILSON	5,810	5,761	5,840	5,623	5,874	5,925	6,000
NIAGARA CO. TOTAL:	227,354	220,756	219,846	224,000	234,000	236,000	239,000
GRAND TOTAL:	1,242,826	1,189,288	1,170,111	1,201,000	1,226,000	1,263,000	1,278,000

	EMPLOYMENT						
ERIE COUNTY:	1980	1990	2000 (Census)	2000 Int	2010 Int	2020 Int	2025
ALDEN	3,167	4,872		4,995	5,142	5,233	5,300
AMHERST	38,769	70,288		86,712	89,253	90,841	92,000
AURORA	8,184	8,059		8,388	8,634	8,788	8,900
BOSTON	622	1,343		1,414	1,455	1,481	1,500
BRANT	275	1,056		1,037	1,067	1,086	1,100
BUFFALO	234,492	229,455		204,809	210,811	214,562	217,300
CHEEKTOWAGA	45,476	52,446		53,158	54,716	55,689	56,400
CLARENCE	7,780	13,964		16,965	17,462	17,773	18,000
COLDEN	334	620		754	776	790	800
COLLINS	1,489	3,554		3,770	3,881	3,950	4,000
CONCORD	2,671	4,059		4,807	4,948	5,036	5,100
EDEN	1,034	1,248		1,791	1,843	1,876	1,900
ELMA	3,403	5,753		7,634	7,858	7,998	8,100
EVANS	3,523	4,284		5,278	5,433	5,529	5,600
GRAND ISLAND	4,702	6,181		7,634	7,858	7,998	8,100
HAMBURG	21,816	25,020		28,276	29,104	29,622	30,000
HOLLAND	1,282	959		943	970	987	1,000
LACKAWANNA	11,389	7,276		8,106	8,343	8,492	8,600
LANCASTER	11,154	13,085		14,986	15,425	15,700	15,900
MARILLA	198	70		94	97	99	100
NEWSTEAD	2,583	2,621		3,016	3,104	3,160	3,200
NORTH COLLINS	1,048	919		1,037	1,067	1,086	1,100
ORCHARD PARK	7,100	12,299		15,740	16,201	16,490	16,700
SARDINIA	290	638		754	776	790	800
TONAWANDA, CITY	6,291	11,274		11,310	11,642	11,849	12,000
TONAWANDA, TOWN	44,475	36,193		32,423	33,373	33,967	34,400
WALES	214	175		283	291	296	300
WEST SENECA	17,371	20,248		19,887	20,470	20,834	21,100
ERIE CO. TOTAL:	481,132	537,959	(N.A. yet)	546,000	562,000	572,000	579,300
NIAGARA COUNTY:							
CAMBRIA	1,286	1,080		1,150	1,182	1,193	1,200
HARTLAND	70	288		383	394	398	400
LEWISTON	4,908	6,675		7,666	7,879	7,950	8,000
LOCKPORT, CITY	19,763	18,792		21,466	22,062	22,261	22,400
LOCKPORT, TOWN	5,812	6,381		7,283	7,485	7,553	7,600
NEWFANE	1,918	2,457		2,875	2,955	2,981	3,000
NIAGARA	3,494	7,102		8,912	9,160	9,242	9,300
NIAGARA FALLS	41,122	32,559		29,899	30,729	31,006	31,200
NORTH TONAWANDA	12,198	12,286		13,224	13,592	13,714	13,800
PENDLETON	964	1,082		1,437	1,477	1,491	1,500
PORTER	1,441	1,066		1,150	1,182	1,193	1,200
ROYALTON	1,866	2,122		2,396	2,462	2,484	2,500
SOMERSET	785	1,047		1,342	1,379	1,391	1,400
WHEATFIELD	5,639	5,952		7,666	7,879	7,950	8,000
WILSON	1,106	1,218		1,150	1,182	1,193	1,200
NIAGARA CO. TOTAL:	102,372	100,107	(N.A. yet)	108,000	111,000	112,000	112,700
GRAND TOTAL:	583,504	638,066		654,000	673,000	684,000	692,000

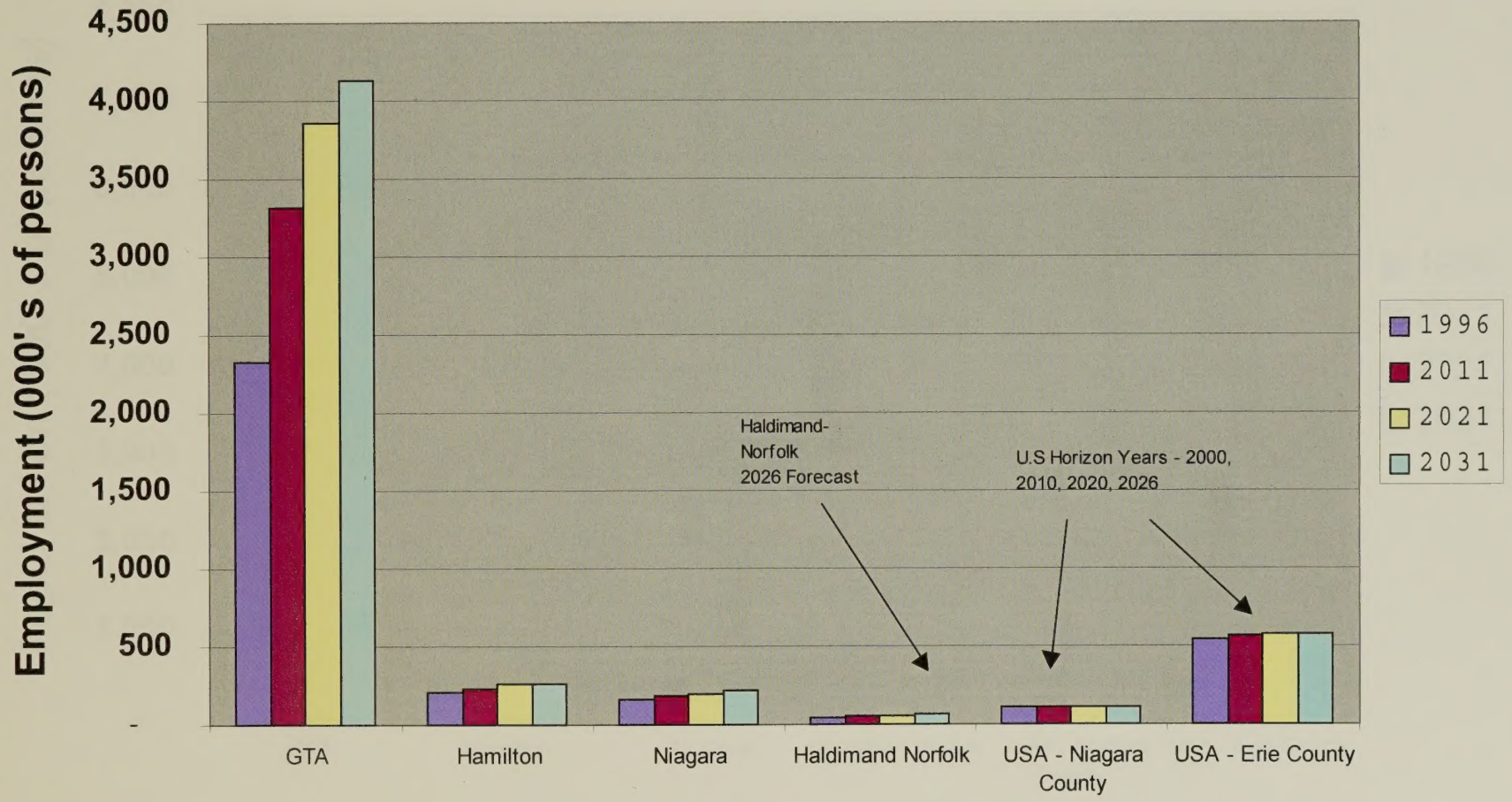


Population Forecasts Base Assumptions



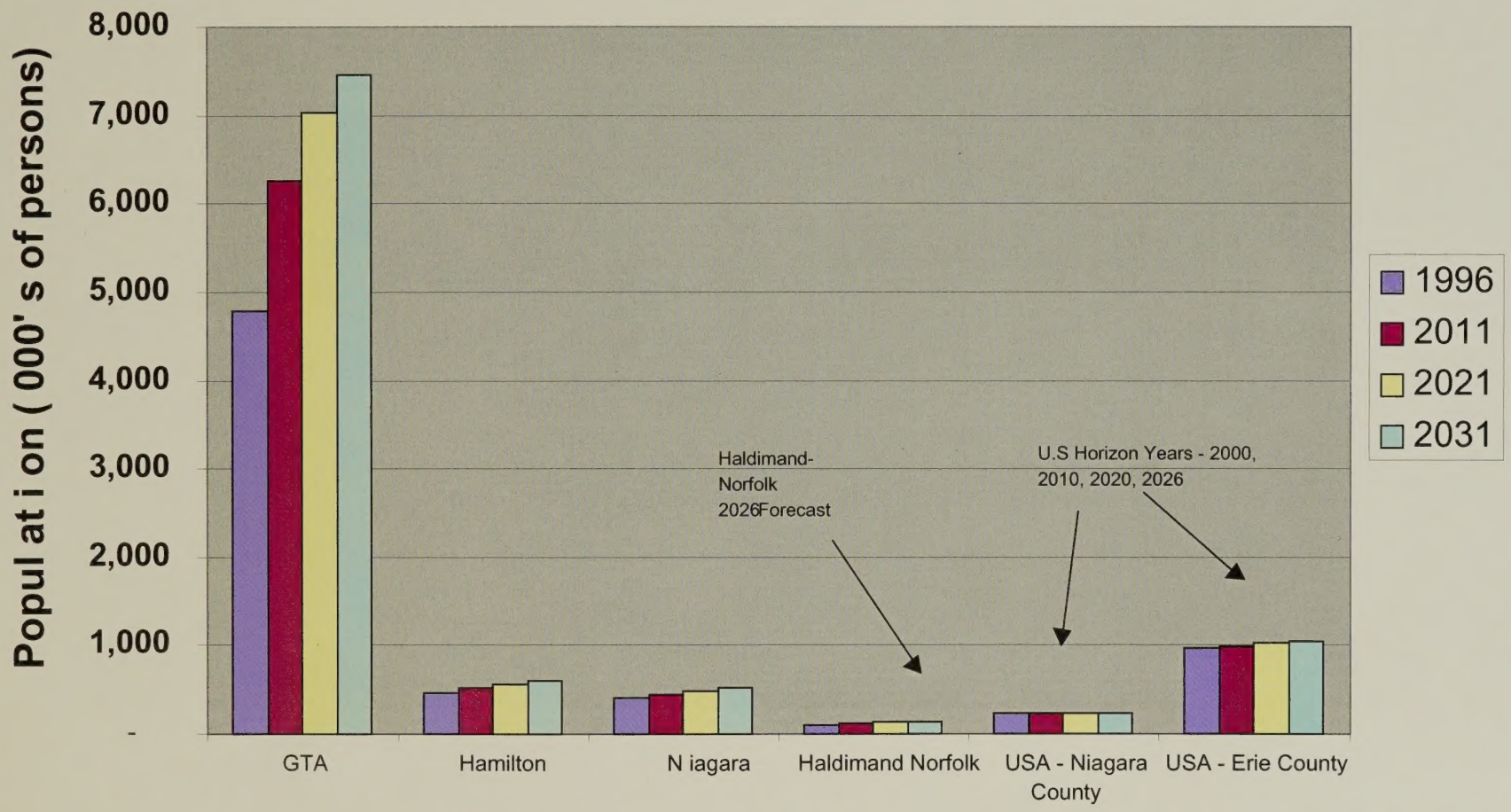
Population Forecasts - Hinterland Growth Adjustment

Employment by Region (1996 - 2031)



Analysis Area Employment Forecasts
Regional Comparisons

Population by Region (1996 - 2031)



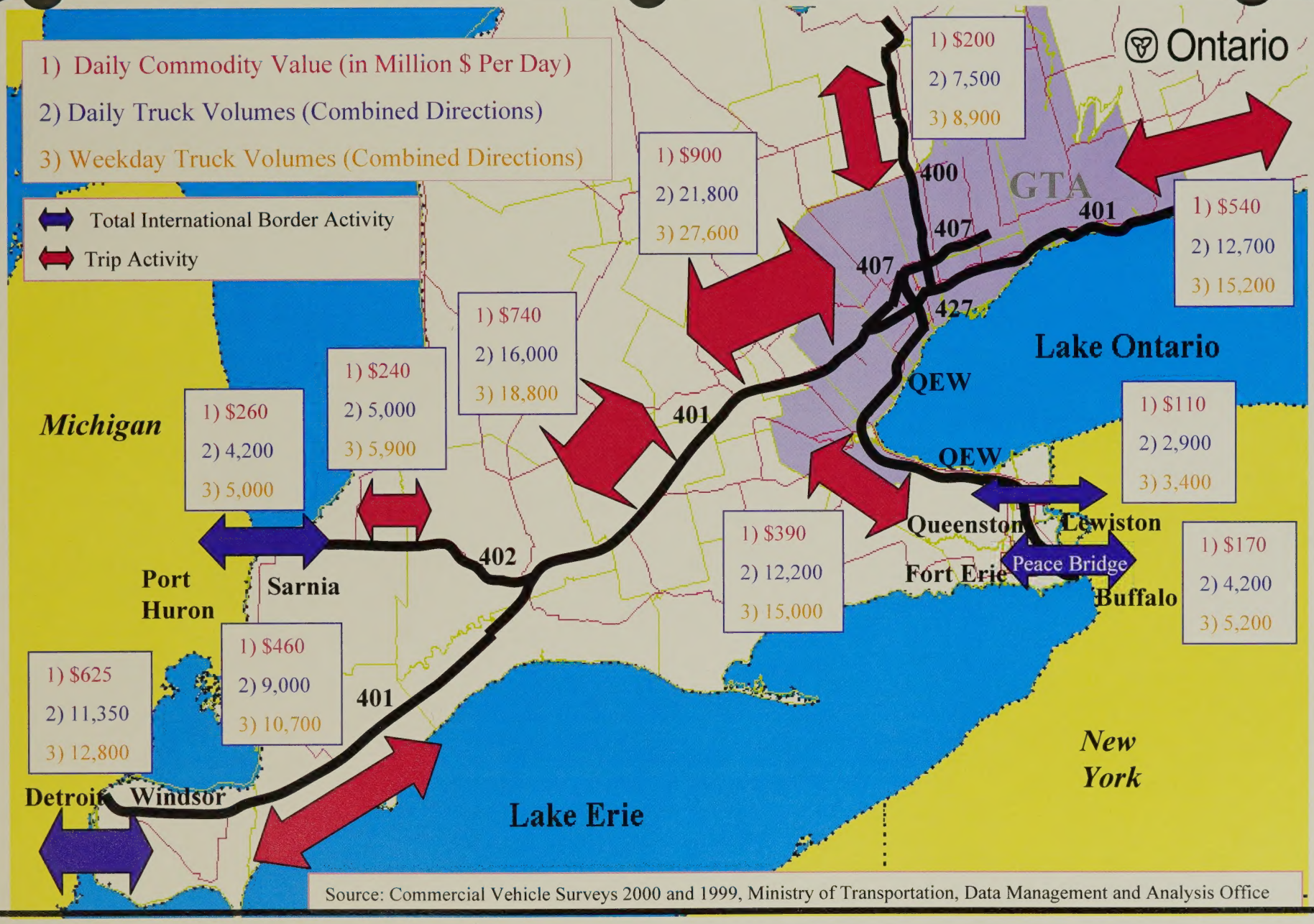
Analysis Area Population Forecasts
Regional Comparisons

APPENDIX C

Daily Cargo Value and Volume

Transportation Infrastructure

Rail Lines
Q-L - Queenston-Lewiston Bridge
W - Whirlpool Bridge
R - Rainbow Bridge
P - Peace Bridge



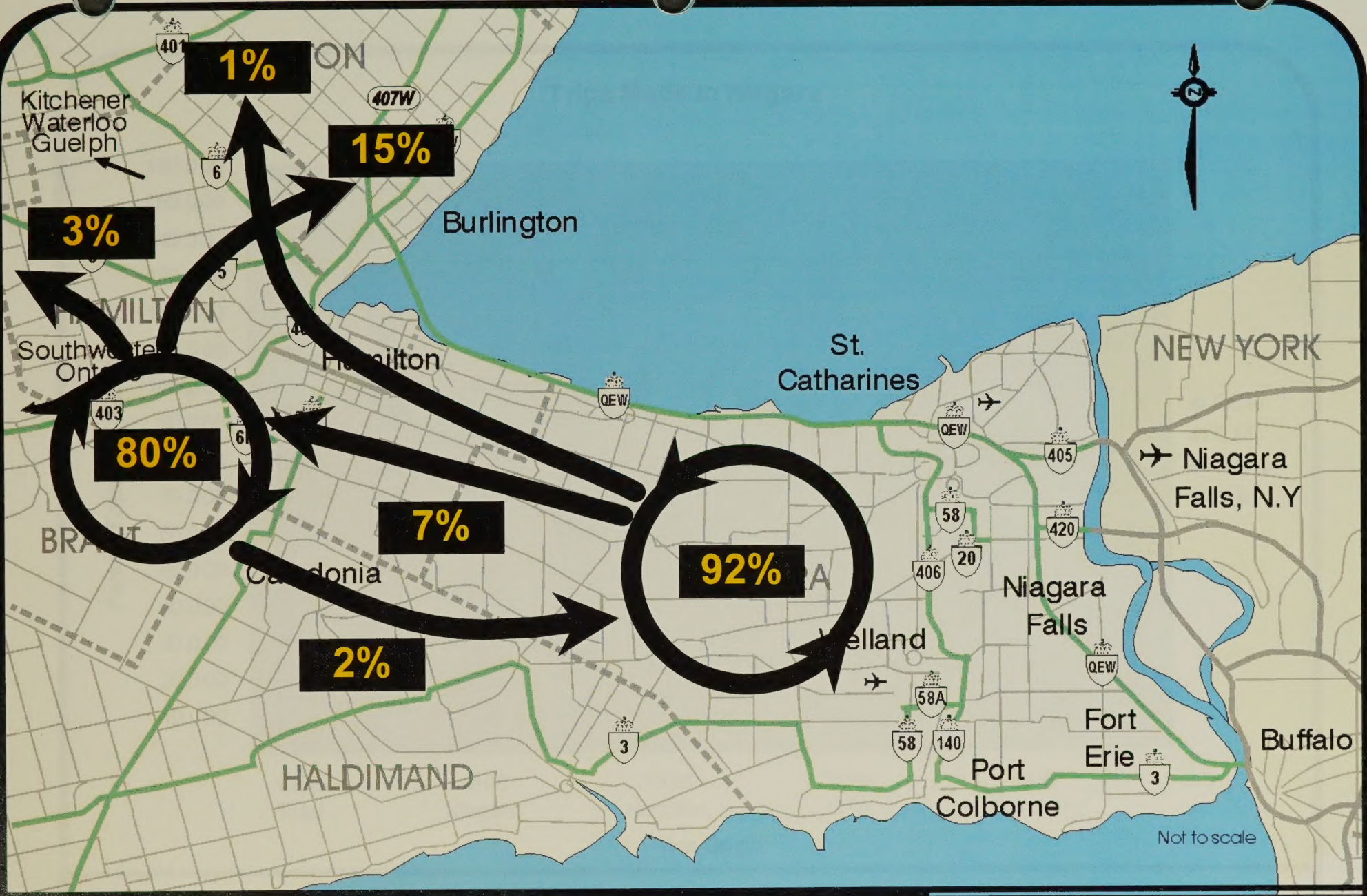
Source: Commercial Vehicle Surveys 2000 and 1999, Ministry of Transportation, Data Management and Analysis Office

2000 Average Daily Truck Cargo Values And Volumes

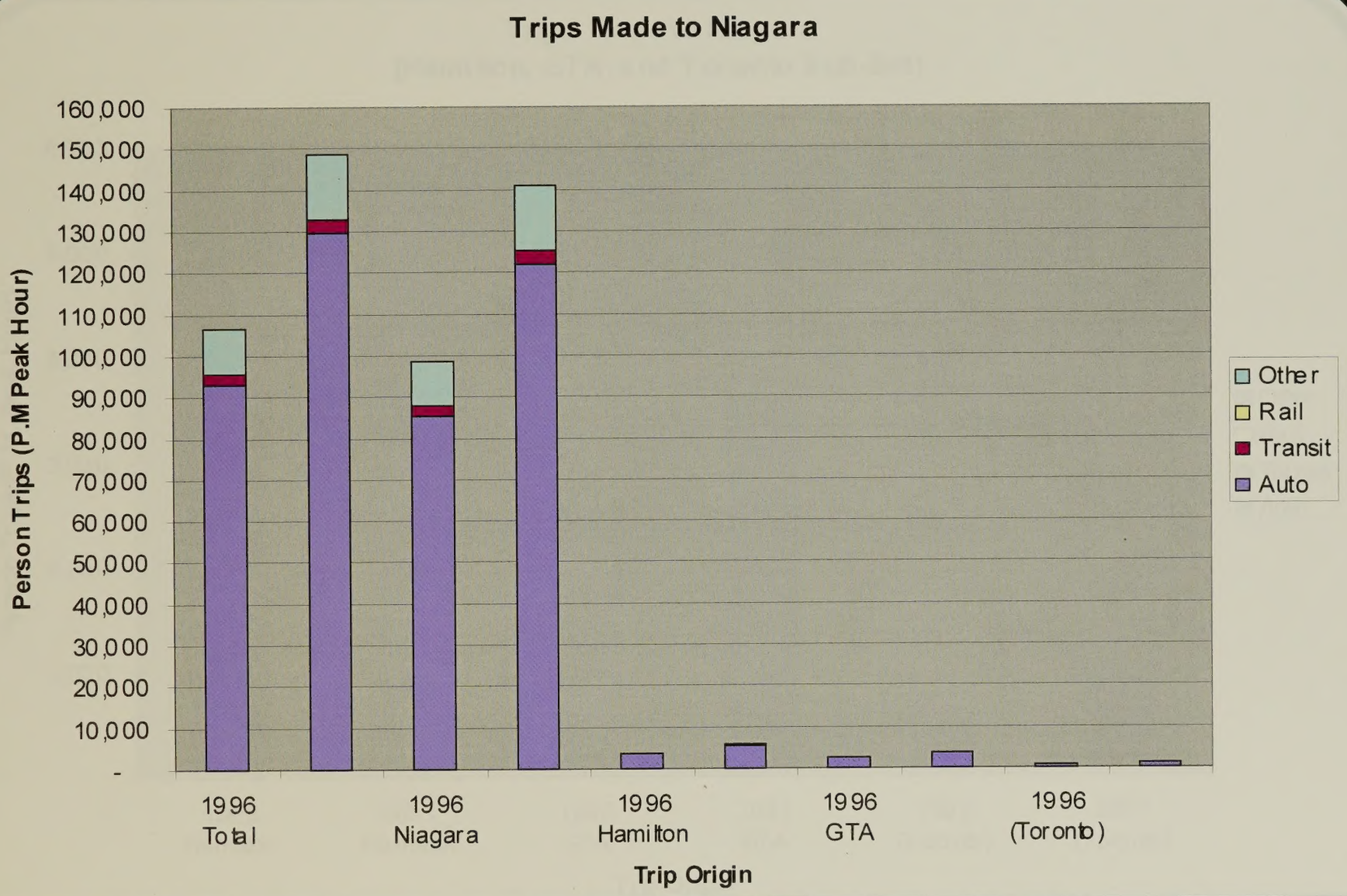
APPENDIX D

Existing Travel

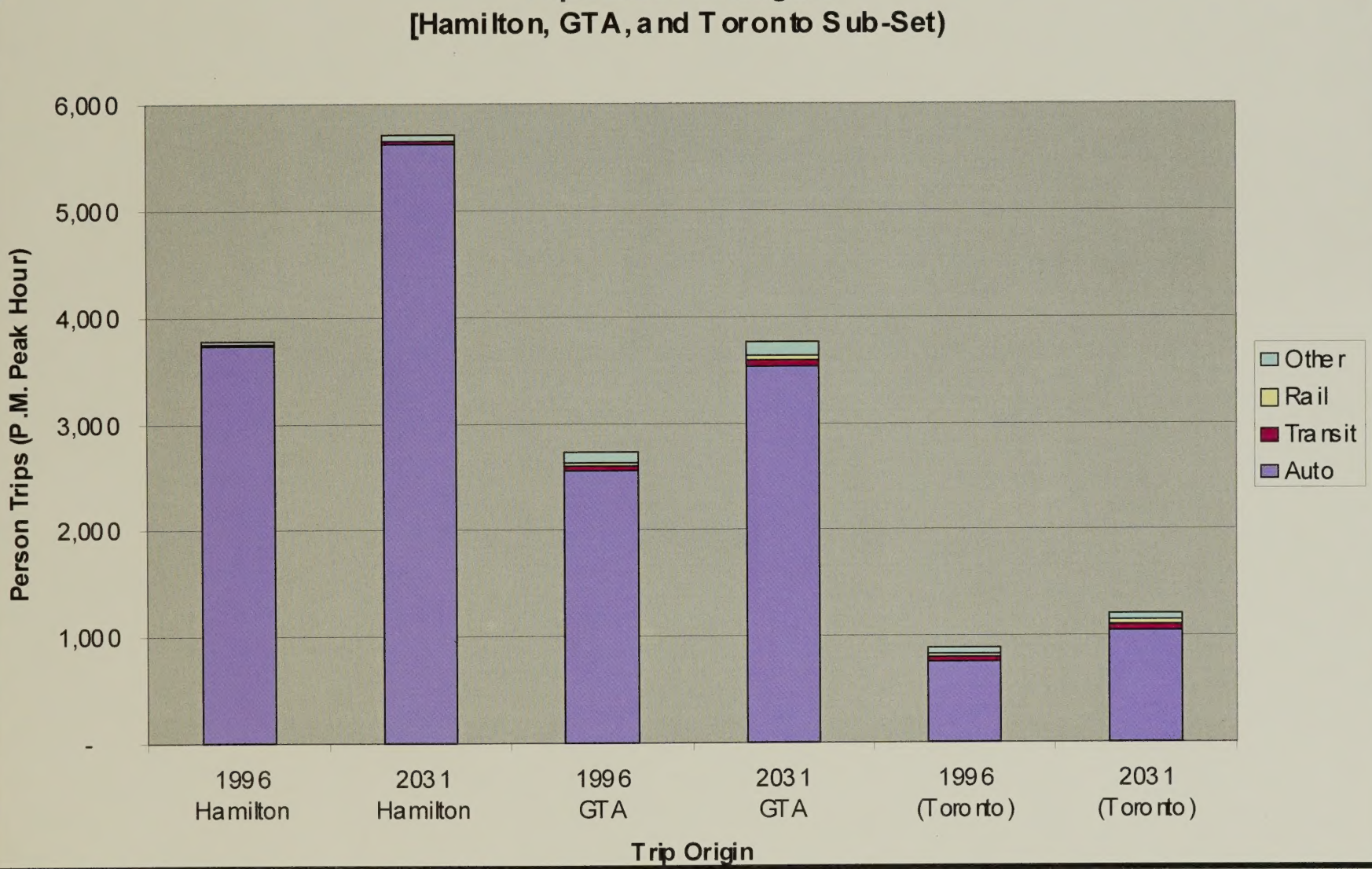
APPENDIX D
1996 TTS DATA



Niagara/Hamilton Home Based Trips –
Trip Distribution

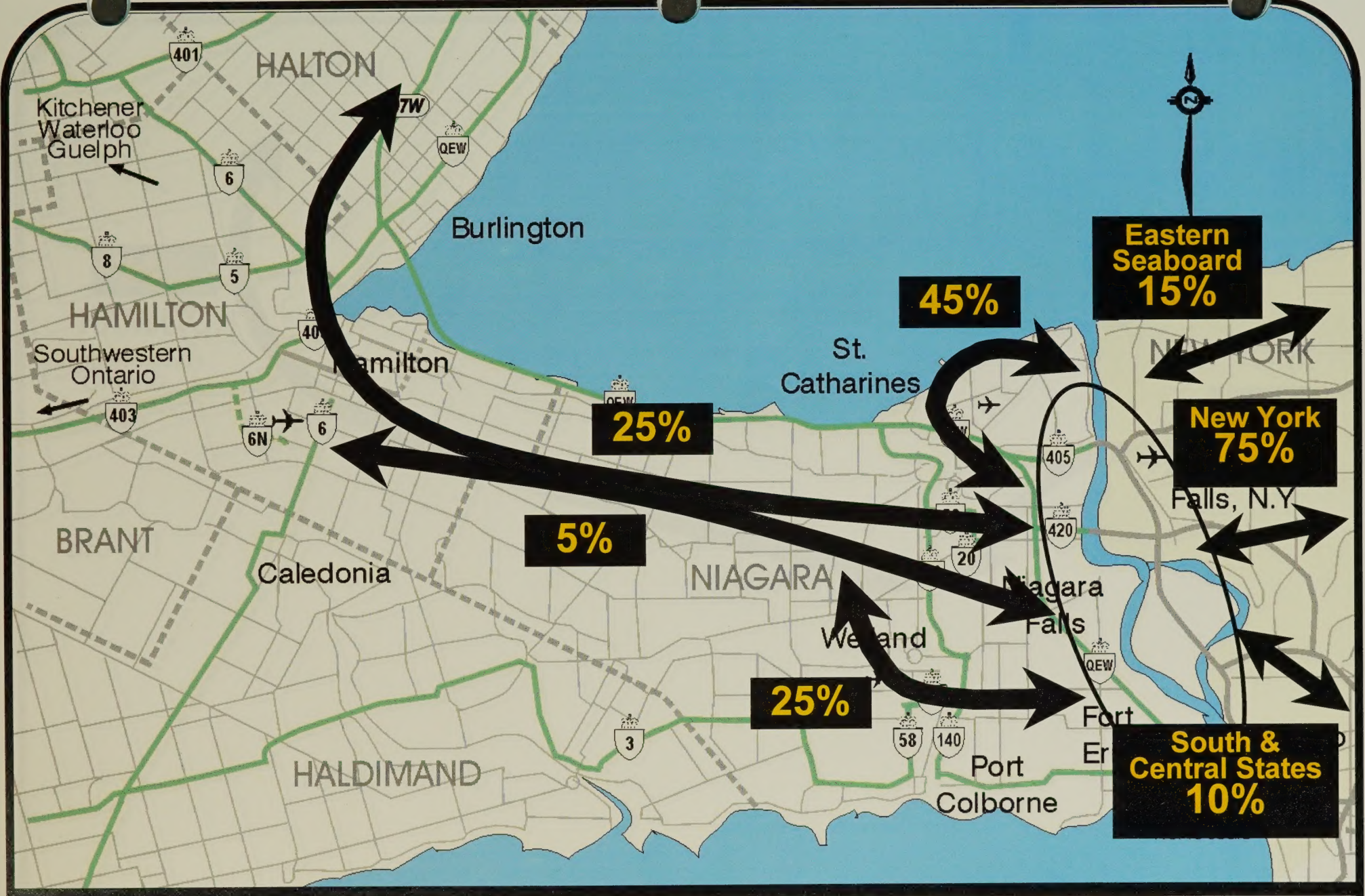


Person Trips Linkages by Origin and Travel Mode



Person Trips Linkages by Origin and Travel Mode -
(Ferry, Rail or Inter City Bus Market Potential)

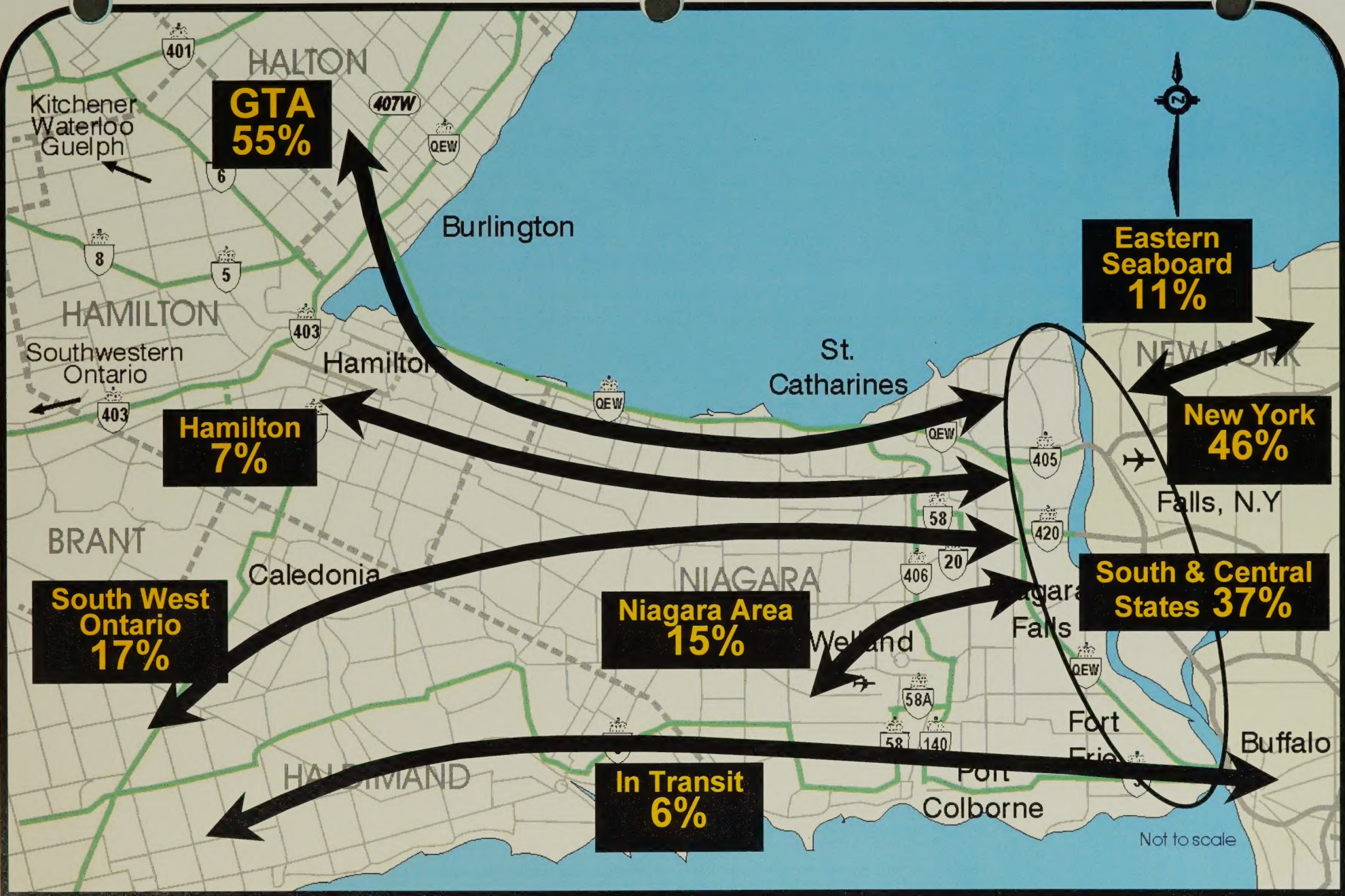
APPENDIX D
PASSENGER VEHICLE SURVEY



Year 2000 Passenger Vehicles Crossing Niagara Gateway

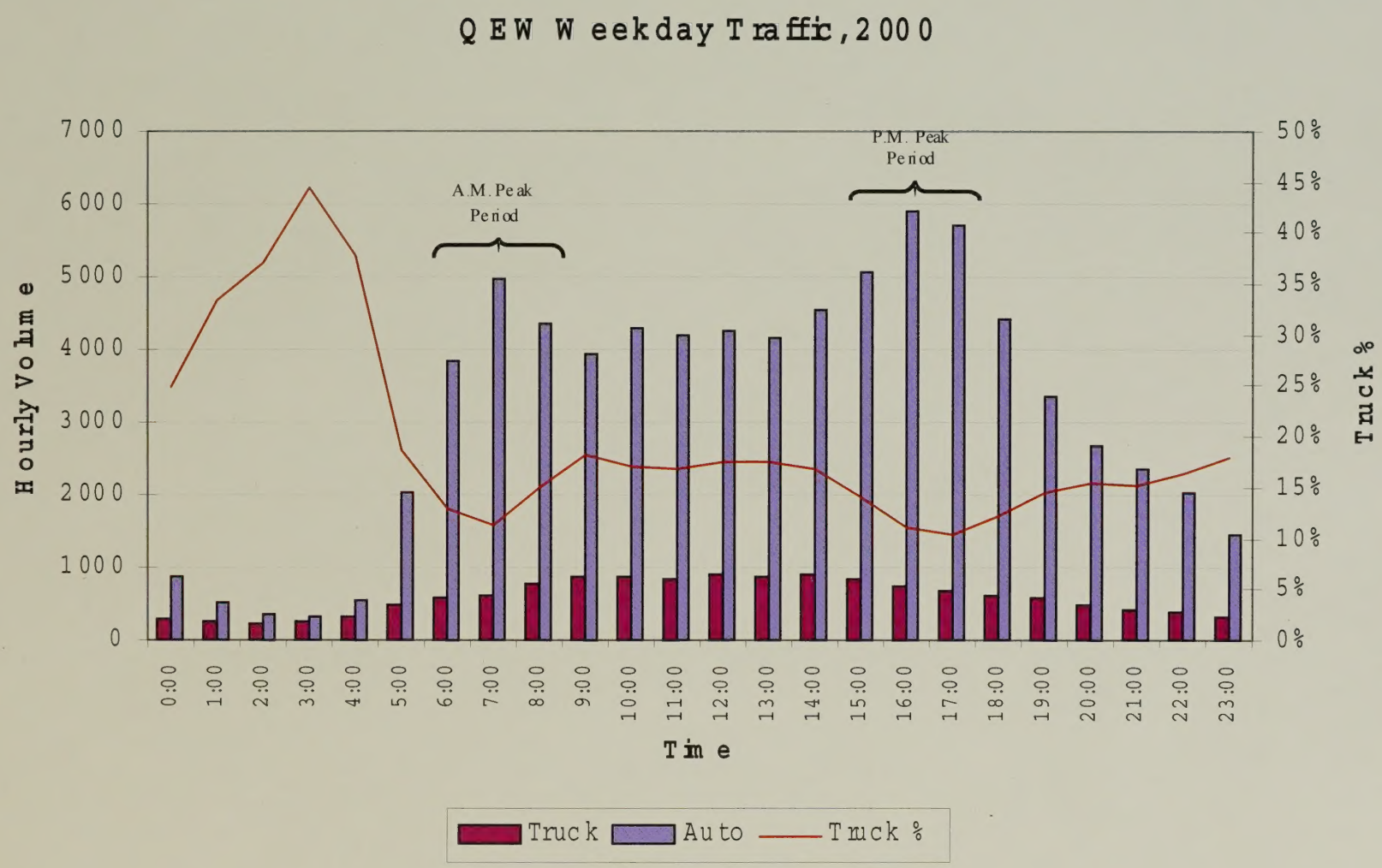
Niagara Falls Tourism Visitation

Appendix D
1999 Commercial Vehicle Survey



Year 1999 Commercial Vehicles Crossing Niagara Gateway (Preliminary Results 1999 CVS)

Appendix D
QEW Profile



QEW Hourly Profile (Two-Way Volume at Fruitland Road)

APPENDIX E

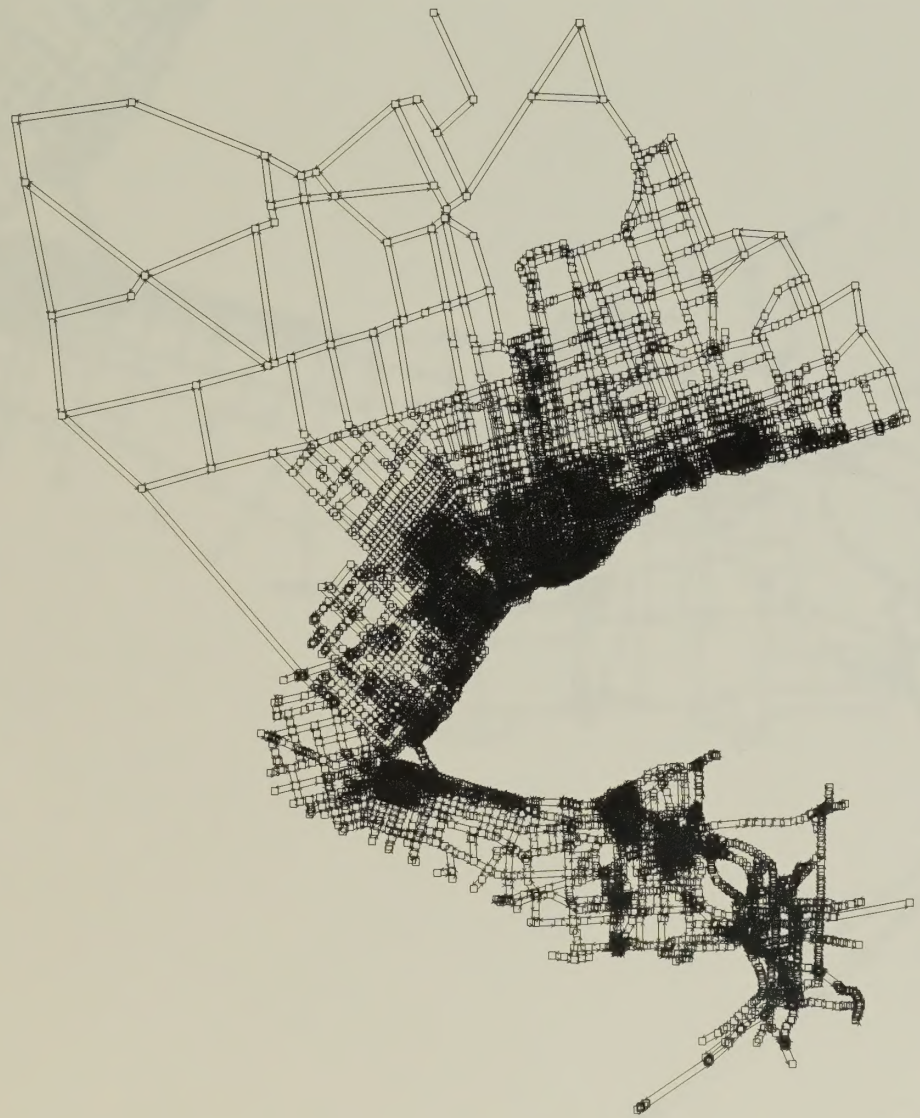
Road Network

Appendix E
Road Network/Traffic Zones

BASE NETWORK

emme/2

LINKS:
ci=0
& cj=0



WINDOW:
429216/ 703294
785451/ 970470

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1: Year 2000 pmpkhr - Existing NEtwork

02-07-05 13:13
MODULE: 2.13
TSH.....pb

BASE NETWORK

emme/2

LINKS:
ci=0
& cj=0

WINDOW:
562210/ 710567
701142/ 814766

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1: Year 2000 pmpkhr - Existing NEtwork

02-07-05 13:14
MODULE: 2.13
TSH.....pb

BASE NETWORK

emme/2

LINKS:
ci=0
& cj=0

WINDOW:
603813/ 739897
672970/ 791765

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1: Year 2000 pmpkhr - Existing NEtwork

02-07-05 13:15
MODULE: 2.13
TSH.....pb

BASE NETWORK

emme/2

LINKS:
ci=0
& cj=0

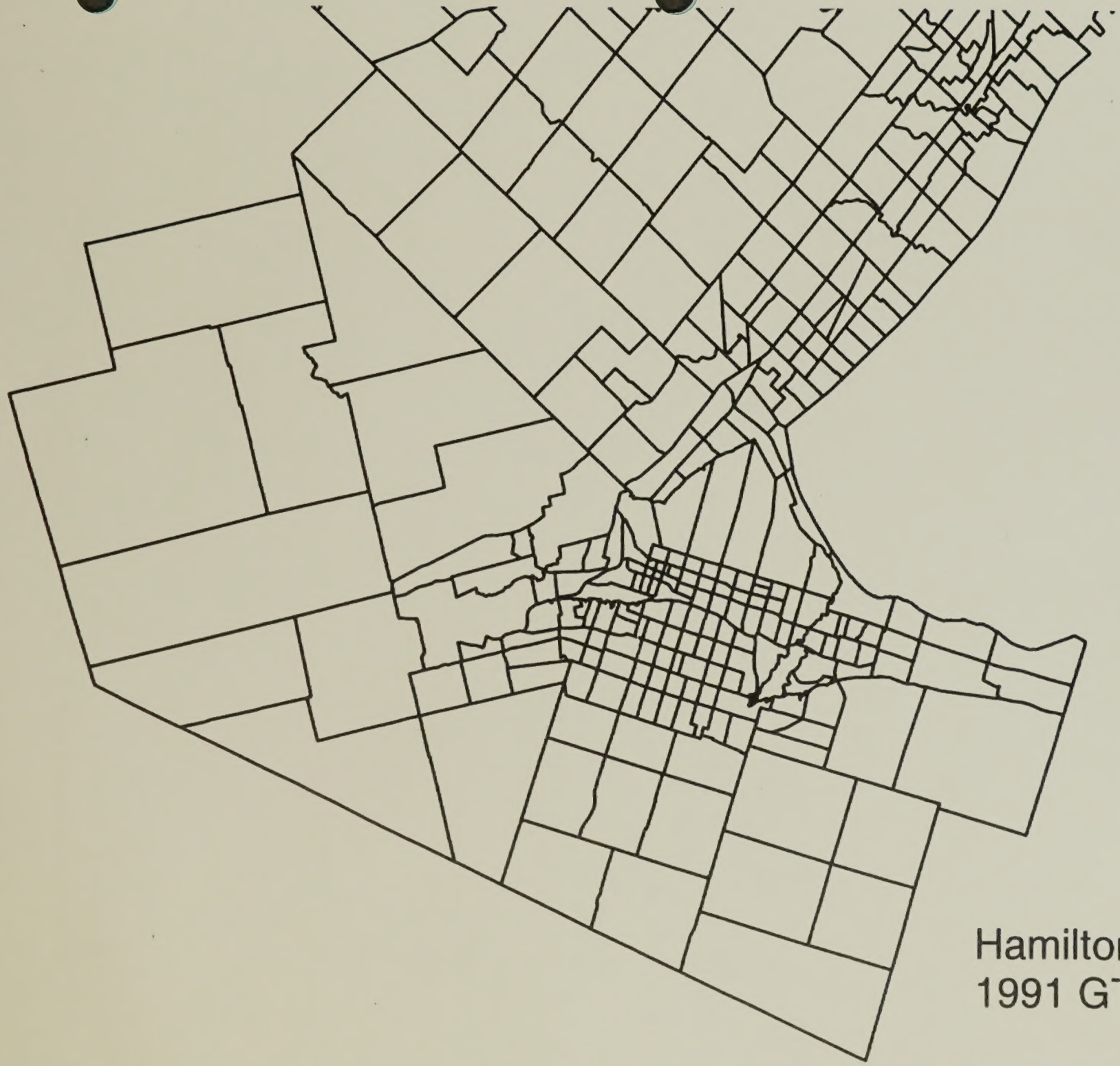
WINDOW:
563986/ 767220
615236/ 805658

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1: Year 2000 pmpkhr - Existing NEtwork

02-07-05 13:16
MODULE: 2.13
TSH.....pb

Niagara Traffic Zones

Niagara Region (520 zones)
Niagara (MTO) Aggregation (175 zones)



Hamilton/Wentworth
1991 GTA Zones

APPENDIX E
FUTURE ROAD IMPROVEMENTS

MTO Road Network - 5 yr Road Network Improvements

Rank	Highway	Segment	Improvement Description
1	Highway 401	Highway 410 to Trafalgar Rd (incl Mississauga Rd IC)	4 to 6 lane widening
2	Highway 401	Harwood Avenue to Brock Street	8 to 10 lane widening
3	QEW	Third Line to Trafalgar Rd	6 to 8 lane widening
4	QEW	Guelph Line to Third Line	6 to 8 lane widening
5	Highway 403	Highway 401 to Highway 407	6 to 8 lane widening
6	Highway 404	Highway 401 to Highway 407 (incl basketweave)	8 to 10 lane widening
7	QEW	Burlington Skyway to Freeman IC	6 to 8 lane widening
8	QEW	Trafalagar Rd to Highway 403 (eastbound)	6 to 8 lane widening
9	Highway 404	Major Mackenzie Dr to Bloomington Rd	8 to 10 lane widening
10	QEW	Red Hill Creek Expressway to Burlington St	6 to 8 lane widening
11	Highway 403	Highway 407 to QEW	4 to 6 lane widening
12	Highway 400	Langstaff Rd to Major Mackenzie Dr	widen to 10 lanes
13	Highway 427	Highway 409 to Highway 407	6 to 8 lane widening
14	Highway 400	Major Mackenzie Dr to King Rd	6 to 8 lane widening
15	QEW	Highway 406 to Garden City Skyway	4 to 6 lane widening
16	Highway 404	Bloomington Rd to Aurora Rd	4 to 6 lane widening
17	Highway 10	5.2 km south of Regional Rd 24 to Highway 9	2 to 4 lane widening
18	Highway 410.	Bovaird Dr to Highway 10	4 lane extension
19	Highway 406	South of Beaverdams Rd to Main Street	2 to 4 lane widening
20	Highway 404	Green Lane Extension	4 lane extension

GTA Road Network - Future Road Network Improvements
Improvements by 2011

Assumed Completion Year	Street / Highway	Segment	Improvement Description
City of Brampton			
1999	Castlemore Road	Airport Road to Goreway Drive	Widen To 4 lanes
1999	HumberWest Pkwy	Highway 7 to Williams Parkway	Widen To 4 lanes
2001	Castlemore Road	Goreway Drive to McVean Drive	New-Construct 4 lanes
2001	HumberWest Pkwy	Williams Parkway to Castlemore Road	Widen To 4 lanes
2001	Sandalwood Pkwy	Heart Lake Road to Dixie Road	New-Construct 4 lanes
2002	Castlemore Road	Highway 50 to Gore Road	Widen To 4 lanes
2003	Sandalwood Pkwy	McLaughlin Road to Chinguacousy Road	Widen To 4 lanes
2004	Goreway Drive	Highway 407 to Highway 7	Widen To 6 lanes
2004	Sandalwood Pkwy	Dixie Road to Bramalea Road	Widen To 4 lanes
2005	Sandalwood Pkwy	Bramalea Road to Airport Road	New-Construct 2 lanes
2007	HumberWest Pkwy	Highway 7 to Williams Parkway	Widen To 6 lanes
2007	Sandalwood Pkwy	Bramalea Road to Airport Road	Widen To 4 lanes
2008	Castlemore Road	Airport Road to Goreway Drive	Widen To 6 lanes
2008	HumberWest Pkwy	Castlemore Road to Airport Road	New-Construct 4 lanes
City of Burlington			
2006	Appleby Line	Upper Middle Road to Highway 5	Widen to 4 lanes
2006	Burloak Drive	Fairview Street to Prince William Drive	Widen to 4 lanes
2006	Burloak Drive	North Service Road to Mainway	Widen to 4 lanes
2006	Guelph Line Overpass	Harvester Road to North Service Road	Widen to 6 lanes
2006	Highway 407	Freeman to Oakville	Construct to 4 lanes
2006	Upper Middle Road	Appleby Line to Burloak Drive	Widen to 4 lanes
City of Mississauga			
1999	Dundas Street	Dixie Road to Cawthra Road	Widen To 7 lanes
1999	Dundas Street	Mavis Road to The Credit Woodlands	Widen To 7 lanes
1999	Dundas Street	Winston Churchill Blvd to Highway 403	Widen To 7 lanes
1999	Hurontario Street	Brittania Road to north of Highway 401	Widen To 6 lanes
2001	Eglinton Avenue	Cawthra Road to west of Hurontario Street	Widen To 6 lanes
2001	Ninth Line	South of Brittania Road to Eglinton Avenue	Widen To 3 lanes
2001	Thomas Street	Winston Churchill Blvd to Ninth Line	New-Construct 4 lanes
2002	Winston Churchill Blvd	Eglinton Avenue to Highway 403	Widen To 6 lanes
2003	Eglinton Avenue	Winston Churchill Blvd to Tenth Line	Widen To 4 lanes
2005	Eglinton Avenue	Tenth Line to Ninth Line	Widen To 4 lanes
2007	Matheson Blvd	Terry Fox Way to Mavis Road	New-Construct 4 lanes
2008	Drew Road	Dixie Road to Tomken Road	New-Construct 4 lanes
MTO			
2006	Highway 407	QEW to Highway 401	Construct to 4\6 lanes
2006	Highway 7	RR 25 to Trafalgar Road	Widen to 4 lanes
2006	QEW	Guelph Line Interchange	Interchange Improvements
2011	Highway 400	Hwy 401 to Hwy 407	Widen to 10 lanes
2011	Highway 400	Hwy 407 to Major Mackenzie	Widen to 8 lanes
2011	Highway 401	Brock Road (Durham Rd 1) to Westney Road	Widen To 10 lanes
2011	Highway 401	Westney Road to Harwood Avenue	Widen To 10 lanes
2011	Highway 404	Hwy 401 to Hwy 407	Widen to 10 lanes
2011	Highway 404	Hwy 407 to Major Mackenzie	Widen to 8 lanes
2011	Highway 48	Highway 407 to Steeles Avenue	Widen To 6 lanes
2011	Highway 48	Major Mackenzie Drive to Stouffville Road	Widen To 4 lanes
2011	Highway 7	Trafalgar Road to Georgetown	Widen to 4 lanes
Region of Durham			
2005	3rd Concession	Pickering Townline Road to Whites Road	Reconstruct & widen to 4 lanes
2005	3rd Concession	Whites Road to Brock Road	Construct new connection to 4 lanes &
2005	3rd Concession	Whites Road to Brock Road	construct new bridge crossing of W.Duffins Creek
2005	Brock Road	Bayly Street to Highway 2	Widen To 6 lanes
2005	Cochrane Street	Dundas Street (Highway 2) to Rossland Road	Reconstruct & widen to 4 lanes
2005	Harmony Road	New on ramp to Highway 401 Westbound	construct new on-ramp
2005	Kingston Road	Pickering-Toronto Boundary to Brock Road	Widen To 6 lanes
2005	Kingston Road	Westney Road to Lakeridge Road	Widen To 6 lanes
2005	Lakeridge Road	Highway 401 interchange	Construct new interim Hwy 401 interchange
2005	Liberty Street	Baseline Road to Taunton Road	Reconstruct & widen to 4 lanes
2005	Martin Road	Highway 401 to 3rd Concession Road	Widen To 4 lanes
2005	Pebblestone Road	Townline Road to Solina Road	Reconstruct & widen to 4 lanes
2005	Pebblestone Road	Townline Road to Solina Road	& construct portions of new connections

GTA Road Network - Future Road Network Improvements
Improvements by 2011

Assumed Completion Year	Street / Highway	Segment	Improvement Description
2005	Stevenson Road	Highway 401 interchange	Construct new interim Hwy 401 interchange
2005	Thickson Road	Victoria Street to Dundas Street (Highway 2)	Widen To 6 lanes
2005	Thickson Road	Winchester Road to Baldwin Street (Highway 7\12)	Widen To 4 lanes
2005	Westney Road	Rossland Road to Taunton Road	Widen To 4 lanes
2005	Westney Road	South of Greenwood to north of Greenwood	Construct new Greenwood by-pass to 2 rural lanes
2011	Altona Road	Sheppard to Finch	Widen to 4 lanes
2011	Brock Road	north to Highway 7	Widen to 4 lanes
2011	Brock Street	Rossland Road to Taunton Road	Widen To 4 lanes
2011	Courtice Road	Highway 401 to Nash Road	Reconstruct & widen to 4 lanes
2011	Finch Street	north to Liverpool	Widen to 4 lanes
2011	Harmony Road	north to Taunton Road	Widen to 4 lanes
2011	Lakeridge Road	Bayley Street to Taunton Road	Widen To 4 lanes
2011	Ritson Road	Taunton Road to Conlin Road	Widen To 4 lanes
2011	Rossland Road	Brock Road to Harmony Road	Reconstruct & widen to 4 lanes
2011	Stevenson Road	Adelaide to Rossland	Widen to 4 lanes
2011	Taunton Road	Pickering Townline Road to Townline Road	Widen To 4 lanes
2011	Thickson Road	Rossland Road to Taunton Road	Widen To 4 lanes
2011	Townline Road	Highway 401 to Taunton Road	Widen to 4 lanes
2011	Westney Road	Rossland Road to Taunton Road	Widen to 4 lanes
2011	Wilson Road	King Street to Taunton Road	Widen to 4 lanes
2011	Winchester Road	Baldwin Street to Thickson Road	Widen To 5 urban lanes
Region of Halton			
2001	Guelph Line	QEW to Mainway	Widen To 6 lanes
2001	Trafalgar Road	Highway 407 to Britannia (Phase 2)	Widen To 4 lanes
2002	Upper Middle Road	East Winston Park Drive to Winston Churchill Blvd	Widen To 4 lanes
2006	Steeles Avenue	9th Line to Winston Churchill Blvd	Widen To 4 lanes
2006	Steeles Avenue	Bronte Street to Martin Street	Widen To 4 lanes
2006	Trafalgar Road	10 Side Road to 15 Side Road	Widen To 4 lanes
2006	Trafalgar Road	15 Side Road to Maple Avenue	Widen To 4 lanes
2006	Trafalgar Road	Campbellville Road to 10 Side Road	Widen To 4 lanes
2006	Trafalgar Road	CPR Crossing from Derry Road to Highway 401	Widen To 4 lanes
2006	Trafalgar Road	Steeles Avenue to Campbellville Road	Widen To 4 lanes
2011	9th Line	5 Side Road to 10 Side Road	Widen To 4 lanes
2011	9th Line	Steeles Avenue to 5 Side Road	Widen To 4 lanes
2011	Steeles Road	Trafalgar Road to 9th Line	Widen To 4 lanes
2011	Trafalgar Road	Maple Avenue to Highway 7	Widen To 4 lanes
Region of Peel			
2005	Brittannia Road West	Winston Churchill Blvd to Ninth Line	Widen To 4 lanes
2011	Airport Road	500m north of Bovaird Street to Sandalwood Parkway	Widen To 4 lanes
2011	Airport Road	Highway 7 to Bovaird Street	Widen To 6 lanes
2011	Airport Road	Ripon Street to Steeles Avenue	Widen To 6 lanes
2011	Dixie Road	Steeles Avenue to Queen Street	Widen To 6 lanes
2011	Highway 7	West Drive to Airport Road	Widen To 6 lanes
2011	Mississauga Road	Highway 401 to Highway 407	Widen To 6 lanes
2011	Mississauga Road	Steeles Avenue to Queen Street	Widen To 4 lanes
2011	Queen Street	Chinguacousy Road to McLaughlin Road	Widen To 4 lanes
2011	Queen Street West	Mississauga Road to Chinguacousy Road	Widen To 4 lanes
2011	Queensway East	Hurontario Street to Etobicoke	Widen To 6 lanes
2011	Steeles Avenue W	Finch Avenue to Etobicoke	Widen To 6 lanes
2011	Steeles Avenue W	McLaughlin Street to Hurontario Street	Widen To 6 lanes
2011	Steeles Avenue W	Winston Churchill to Chinguacosy Road	Widen To 4 lanes
2011	The Gore Road	Highway 7 to Castlemore Road	Widen To 4 lanes
Region of York			
1999	Bayview Avenue	Stouffville Road to Bloomington Road	Widen To 4 lanes
1999	Islington Avenue	Steeles Avenue to Highway 7	Widen To 4 lanes
1999	Leslie Street	Major Mackenzie Drive to Elgin Mills Road	Widen To 4 lanes
1999	Wellington Street East	CN Rail Line to Leslie	Widen To 4 urban lanes
2000	Bayview Avenue	Wellington to Mirlock Drive	
2000	Herald Place	Leslie Street to Woodbine Avenue	
2000	St. Johns Side Road	Yonge Street to Bayview Avenue	Reconstruct 2 rural lanes
2001	Bathurst Street	King Road to Aurora Road	Widen To 4 rural lanes
2001	Dufferin Street	Highway 407 to Rutherford Road	Widen To 4 lanes
2001	Highway 27	Highway 7 to Rutherford Road	Widen To 4 lanes
2001	Islington Avenue	Highway 7 to Langstaff Road	Widen To 3 lanes
2001	Islington Avenue	Langstaff Road to Rutherford Road	Widen To 4 lanes

GTA Road Network - Future Road Network Improvements
Improvements by 2011

Assumed Completion Year	Street / Highway	Segment	Improvement Description
2001	Jane Street	Major Mackenzie Drive to south of Teston Road	Widen To 4 lanes
2001	Kennedy Road	16th Avenue to Major Mackenzie Drive	Widen To 4 lanes
2001	Langstaff Road	Pine Valley to Islington Avenue	Widen To 4 lanes
2001	Markham By-Pass	Highway 407 to existing by-pass	New-Construct 4 lanes
2001	McCowan Road	16th Avenue to Major Mackenzie Drive	Widen To 4 lanes
2001	Mulock Drive	Bathurst Street to Yonge Street	Widen To 4 lanes
2001	Ninth Line	Highway 407 to 16th Avenue	Reconstruct and widen to 4 lanes
2001	Poplar Banks Side Road	Bathurst Street to Yonge Street	Widen to 4 paved lanes
2001	Rutherford Road	Weston Road to Highway 27	Widen To 4 lanes
2002	Bathurst Street	Gamble Road to King Road	Widen To 4 rural lanes
2002	Bayview Avenue	Elgin Mills Road to 19th Avenue	Widen To 4 lanes
2002	Bloomington Road	Yonge Street to Bayview Avenue	Widen To 4 lanes
2002	Elgin Mills Road	Bayview to Leslie	Widen To 4 lanes
2002	Elgin Mills Road	Leslie to Mackland Street	Widen To 4 rural lanes
2002	Highway 7	200 meters east of Rouge River to Warden Avenue	Widen To 7 lanes
2002	Islington Avenue	Rutherford Road to Major Mackenzie Drive	Widen To 4 lanes
2002	King City By-Pass		
2002	Major Mackenzie Drive	Woodbine Avenue to Kennedy Road	Widen To 4 lanes
2002	Markham By-Pass	Extended to 16th Avenue to Ninth Line	New-Construct 4 lanes
2003	Dufferin Street	Rutherford Road to Major Mackenzie Drive	Widen To 4 lanes
2003	Woodbine Avenue	Ravenshoe Road to Morton Avenue	Widen To 4 lanes
2004	Bathurst Street	Aurora Road to Mulock Street	Widen To 4 rural lanes
2004	Markham By-Pass	Extended from Hwy 407 to Ninth Line	New-Construct 4 lanes
2004	Ninth Line	16th Avenue to Stouffville Road	Widen To 4 lanes
2004	Rutherford Road	Highway 27 to Highway 50	Widen To 4 lanes
2004	Weston Road	Rutherford Road to Major Mackenzie Drive	Widen To 4 lanes
2005	Bayview Avenue	Highway 407 to 16th Avenue	Widen To 7 lanes
2005	Highway 27	Rutherford Road to Major Mackenzie Drive	Widen To 4 lanes
2005	Warden Avenue	Steeles Avenue to 14th Avenue	Widen To 6 lanes
2006	Bloomington Road	Bayview Avenue to Highway 400	Widen To 4 lanes
2006	Dufferin Street	Steeles Avenue to Glen Shields Drive North	Widen To 6 lanes
2006	Highway 7	Warden Avenue to Main Street	Widen To 7 lanes
2006	Stouffville Road	Woodbine Avenue to Warden Avenue	Widen To 4 lanes
2007	Elgin Mills Road	Regent Street to Bayview Avenue	
2007	Highway 7	Highway 27 to Pine Valley	Widen To 6 lanes
2007	Jane Street	Rutherford Road to Major Mackenzie Drive	Widen To 4 lanes
2007	Kennedy Road	Highway 407 to Highway 7	Widen To 6 lanes
2007	Major Mackenzie Drive	Highway 400 to Weston Road	Widen To 4 lanes
2007	Major Mackenzie Drive	9th Line to York \ Durham Line	Reconstruct to 2 paved lanes
2007	Warden Avenue	16th Avenue to Major Mackenzie Drive	Widen To 4 lanes
2007	Woodbine Avenue	Major Mackezie Drive to south end of Victoria Square	Widen To 4 lanes
Town of Milton			
2006	Derry Road	Highway 25 to 4th Line	Widen To 4 lanes
2006	Main Street	West of James Snow Parkway	Widen To 4 lanes
2006	Thompson Road	Derry Road to Steeles Avenue	Widen To 4 lanes
Town of Oakville			
2006	3rd Line	Upper Middle Road to Wyecroft Road	Widen To 4 lanes
2006	3rd Line	Upper Middle to Dundas Street	Widen To 4 lanes
2006	6th Line	Dundas Street to Glenashton	Widen To 4 lanes
2006	8th Line	Cornwall Road to Iroquois Shore	Construct to 4 lanes
2006	Burloak Drive	Wyecroft Road to Rebecca Street	Construct to 2 lanes
2006	Cornwall Road	Chartwell to Morrison Road	Widen To 4 lanes
2006	Cornwall Road	Maple Grove Road to Ford Drive	Widen To 4 lanes
2006	Dorval Drive	Rebecca to Lakeshore	Widen To 4 lanes
2006	Dorval Drive	Speers Road to North Service Road	Widen To 4 lanes
2006	Dundas Street	Highway 403 to Winston Churchill Blvd	Widen To 6 lanes
2006	Iroquois Shore	8th Line to Invicta Drive	Widen To 4 lanes
2006	Neyagawa Blvd	Burnhamthorpe to Highway 407	Construct to 2 lanes
2006	North Service Road	North Service Road to Ford Drive	Construct to 2 lanes
2006	Rebecca Street	Bridge over Bronte Creek	Construct to 4 lanes
2006	Upper Middle Road	3rd Line to Nottinghill Gate	Widen To 4 lanes
2006	Wyecroft Road	4th Line to Dorval Drive	Widen To 4 lanes
2011	Cornwall Road	Ford to Winston Churchill	Construct to 2 lanes
2011	New Link (1)	Burloak to Rebecca	Construct to 4 lanes
2011	New Link (2)	Rebecca to Lakeshore	Construct to 2 lanes
2011	Neyagawa Blvd	Dundas Street to Highway 407	Widen To 4 lanes
2011	Speers Road	Bronte Road to 3rd Line	Widen To 4 lanes

GTA Road Network - Future Road Network Improvements
Improvements by 2011

Assumed Completion Year	Street / Highway	Segment	Improvement Description
2011	Upper Middle Road	Bronte Road to 3rd Line	Widen To 4 lanes
2011		Realigning Old Burloak (connecting New Link 1&2)	Construct to 2 lanes
Region of Niagara			
2000-2002	Reg'l Rd 98 (Montrose Rd)	Highway 420 to Thorold Stone Road	Widen To 4 lanes
2000	Reg'l Rd 18 (Ontario St)	At South Service Road	Widen To 4 lanes
2000	Reg'l Rd 89 (Glendale Ave)	Coon Road to Taylor Road	Widen To 4 lanes
2000	Reg'l Rd 57 (Thorold Stone)	Kalar Rd to Davis Rd	Widen To 4 lanes
2000	Reg'l Rd 20 (Old Hwy 20)	Pelham Road to Highway 406	Widen To 4 lanes
2000	Reg'l Rd 81 (York Road)	Taylor Road to Townline Road	Widen To 4 lanes
2000	Reg'l Rd 102 (Stanley Ave)	At Valley Way	Widen To 4 lanes
by 2011	Stanley Ave	North of Hwy 420	Widen To 4 lanes
by 2011	Stanley Ave	McLeod Rd to Portage Rs	Widen To 4 lanes
by 2011	QEW	Highway 405 to Highway 420	Widen To 6 lanes

GTA Road Network - Future Road Network Improvements
Improvements by 2021

Assumed Completion Year	Street / Highway	Segment	Improvement Description
City of Burlington			
2016	Appleby Line	Highway 5 to Highway 407	Widen to 4 lanes
2016	Burloak Drive	Upper Middle Road to Mainway	Widen to 4 lanes
2016	Cumberland Avenue	Link from Fairview Street to Harvester Road	Construct to 2 lanes
2016	New South Service Road	Waterdown Road to King Road	Construct to 2 lanes
2016	North Service Road	Brant Street to King Road	Widen to 4 lanes
2016	Waterdown Road	Plains Road to North Service Road	Widen to 4 lanes
Region of Durham			
2021	Altona Road	Finch to Taunton	widen to 4 lanes
2021	Brock Road	Bayly to Taunton	widen to 6 lanes
2021	Brock Road	Taunton to Highway 407, incl Brougham By-Pass	widen to 6 lanes
2021	Brock Road	north to Highway 7	widen to 6 lanes
2021	Courtice Road	Nash Road to 7th Concession	widen to 4 lanes
2021	Finch Avenue	Liverpool to Brock	widen to 4 lanes
2021	Harmony Road	to Winchester Road	widen to 4 lanes
2021	Harwood Avenue	Bayly to Taunton - new align	new align - 2 lanes
2021	Highway 401	Harwood to Highway 12	widen to 8 lanes
2021	Highway 401	Lakeridge Road interchange	construct new interchange
2021	Highway 407	East of Brock Road to Courtice Road	construct 4 lanes
2021	Lakeridge Road	Taunton Road to Highway 407	widen to 4 lanes
2021	Pickering Beach	Highway 401 to Highway 407	widen to 4 lanes
2021	Ravenscroft	Rossland to Taunton	construct to 2 lanes
2021	Rossland Road	Harmony Road to Townline Road	widen to 4 lanes
2021	Rossland Road	Pickering Townline to Brock Road	widen to 4 lanes
2021	Stevenson Road	Rossland to Conlin	widen to 4 lanes
2021	Taunton Road	Pickering Townline to Brock Road	widen to 6 lanes
2021	Thickson Road	Taunton Road to Highway 7/12	widen to 4 lanes
2021	Westney Road	Kingston Road to Highway 7	widen to 4 lanes
2021	Whites	Finch to Taunton	widen to 4 lanes
2021	Whites	north to Finch	widen to 6 lanes
2021	Whitevale	RR 30 to Brock Road	widen to 4 lanes
2021	Wilson	King to Taunton	widen to 4 lanes
Region of York			
2021	19th Avenue	Bayview to Bathurst	Widen To 4 lanes
2021	Bayview Avenue	19th Avenue to Stouffville Road	Widen To 4 lanes
2021	Elgin Mills Road	Markland Street to Woodbine Avenue	Widen To 4 lanes
2021	Langstaff Road	Highway 27 to Highway 50	Widen To 4 lanes
2021	Major Mackenzie Drive	Kennedy Road to the new Markham By-Pass	Widen To 4 lanes
2021	Markham By-Pass	Ninth Line to Major Mackenzie Drive	New-Construct 4 lanes
2021	New Markham By-Pass	Major Mackenzie Drive to Highway 48	Widen To 4 lanes
2021	Teston Road	Keele to Weston Road	Widen To 4 lanes
2021	Teston Road	Dufferin Avenue to Keele Street	Widen To 4 lanes
2021	Teston Road	Bathurst Street to Dufferin Avenue	Widen To 4 lanes
2021	Warden Avenue	Highway 407 to Apple Creek Road	Widen to 6 lanes, also involves the widening of
2021	Warden Avenue	Highway 407 to Apple Creek Road	Can. National Railway crossing and Rouge River Bridge
Town of Oakville			
2016	3rd Line	Dundas Street to Burnhamthorpe Road	Construct to 4 lanes
2016	Bronte Road	Wyecroft to QEW	Widen To 4 lanes
2016	Burnhamthorpe Road	Bronte Road to 9th Line	Widen To 4 lanes
2016	Wyecroft Road	Bronte Road to Dorval Drive	Widen To 4 lanes
2016	Wyecroft Road	Burloak to Bronte Road	Construct to 4 lanes

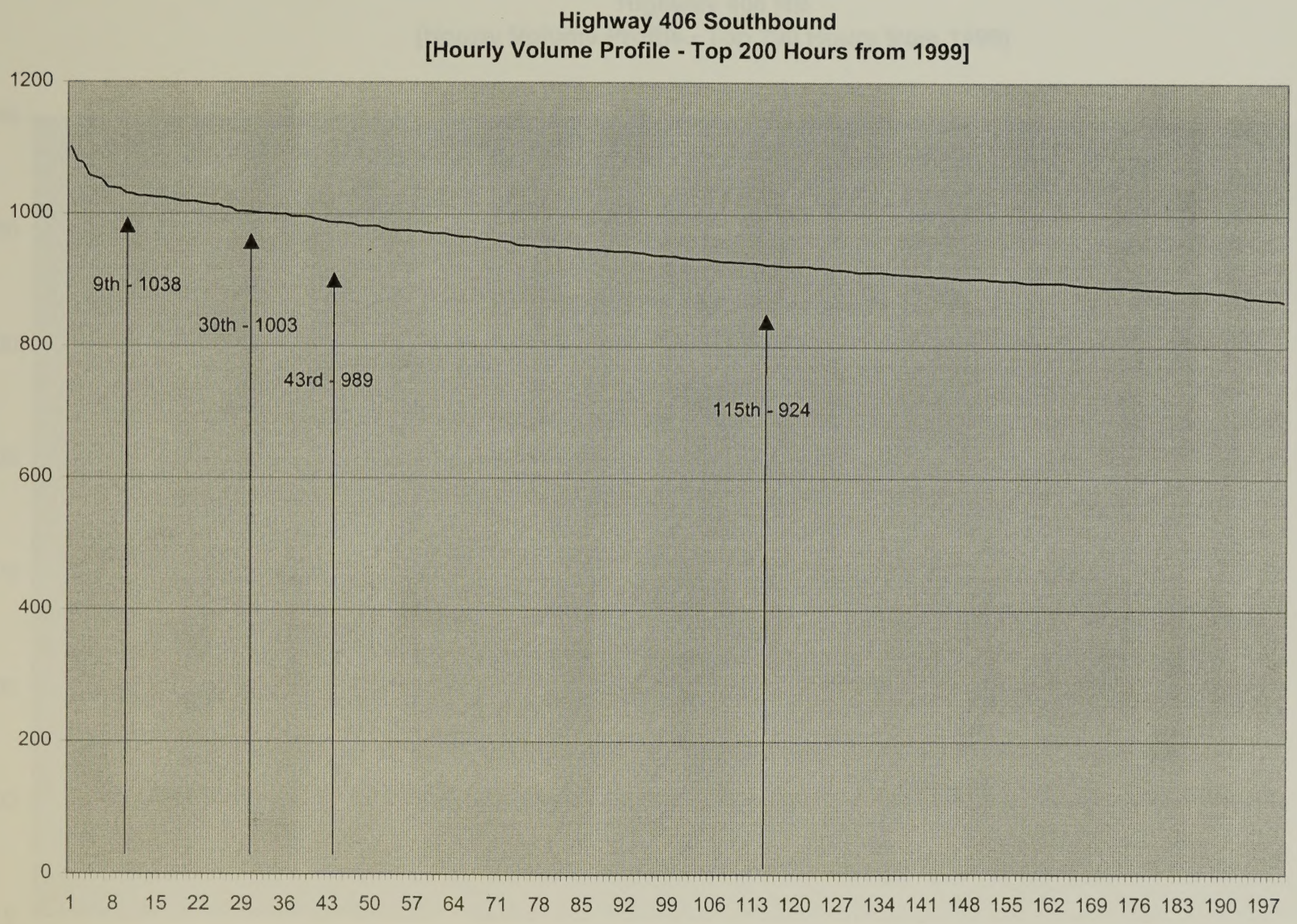
GTA Road Network - Future Road Network Improvements
Improvements by 2031

Assumed Completion Year	Street / Highway	Segment	Improvement Description
Region of Durham			
2031	Taunton Road	Brock Road to Lakeridge Road	widen to 6 lanes
2031	Whites	Finch to Highway 7	widen to 6 lanes

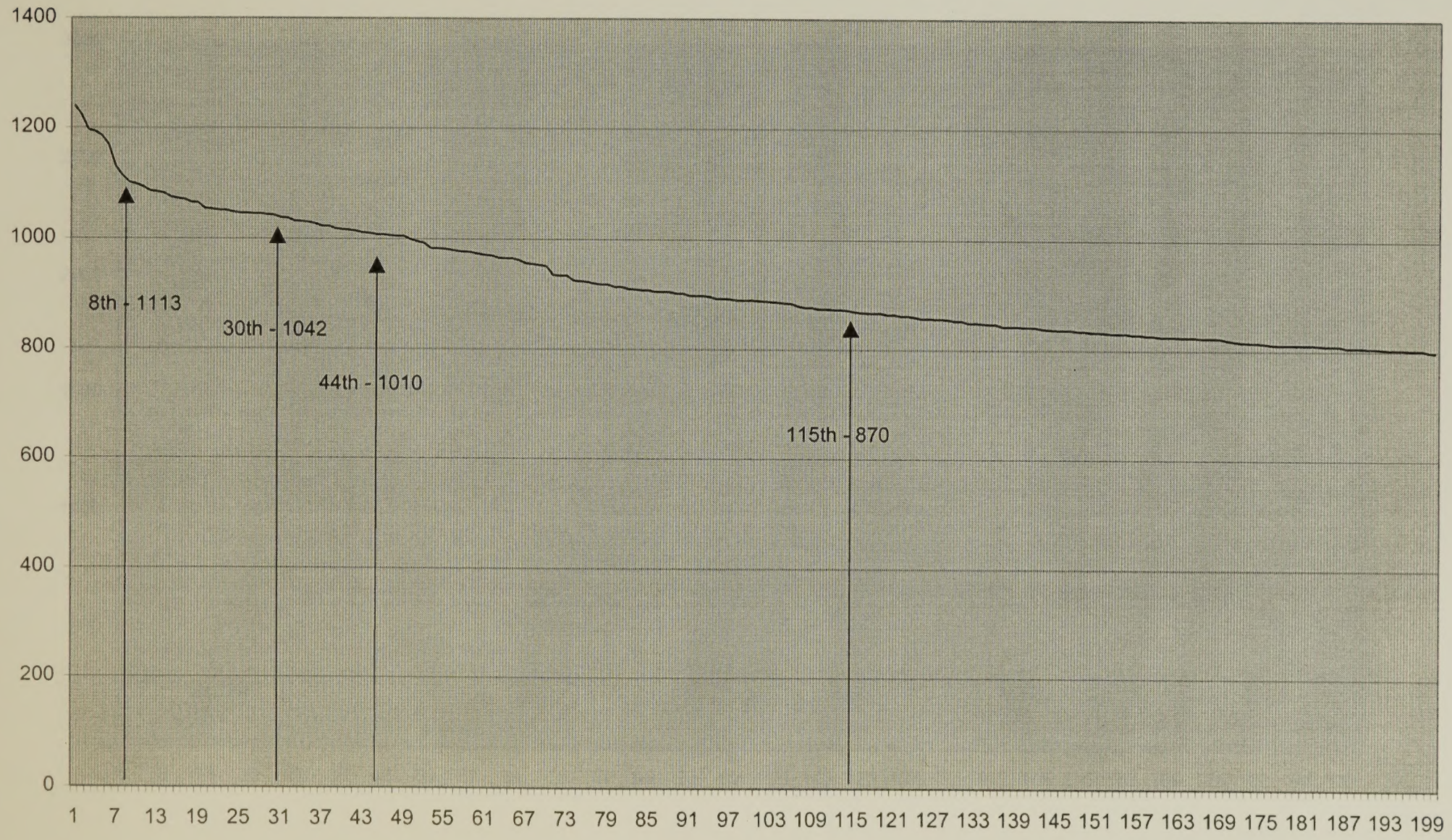
APPENDIX F

Design Hour

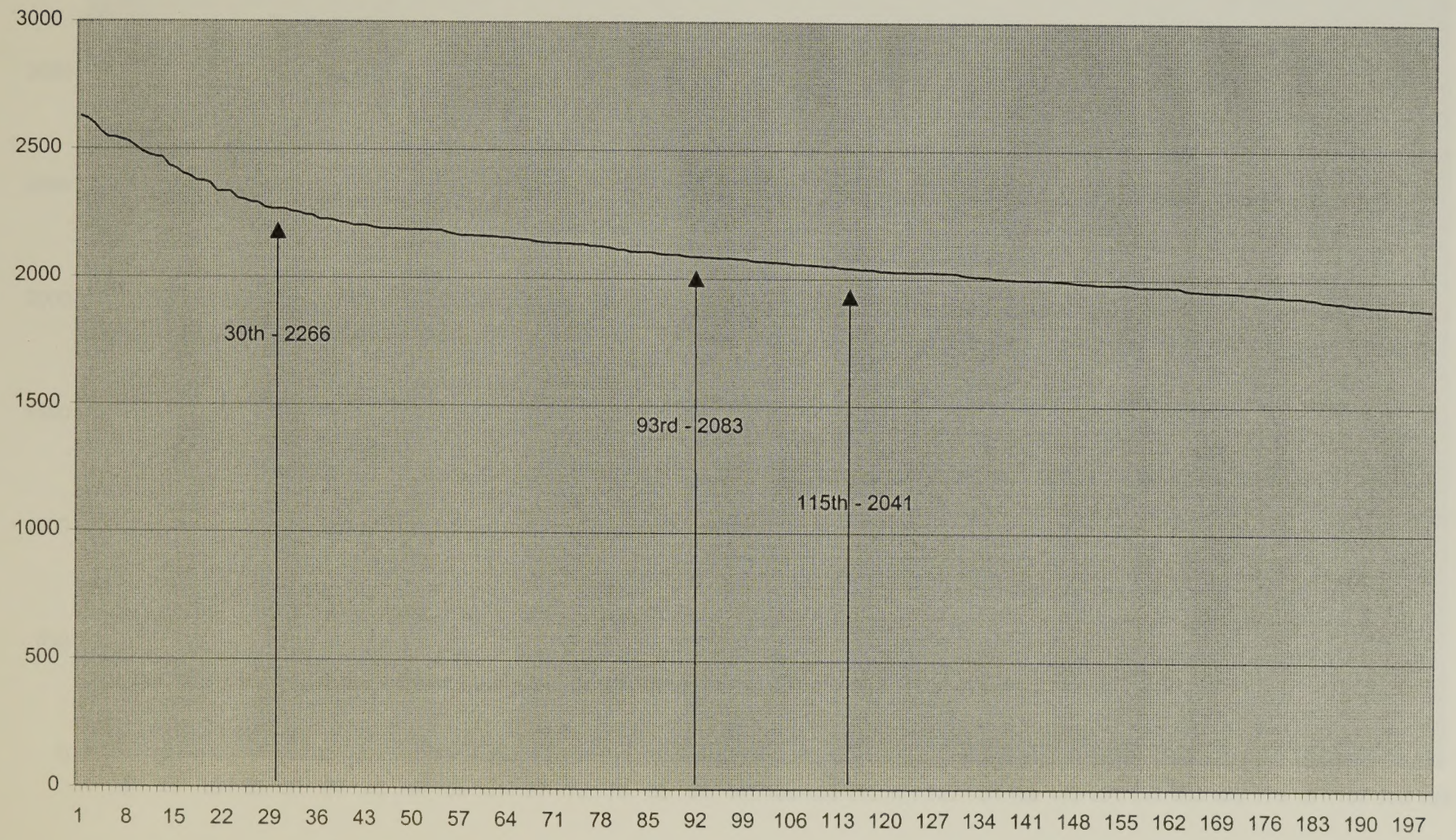
APPENDIX F
DESIGN HOUR

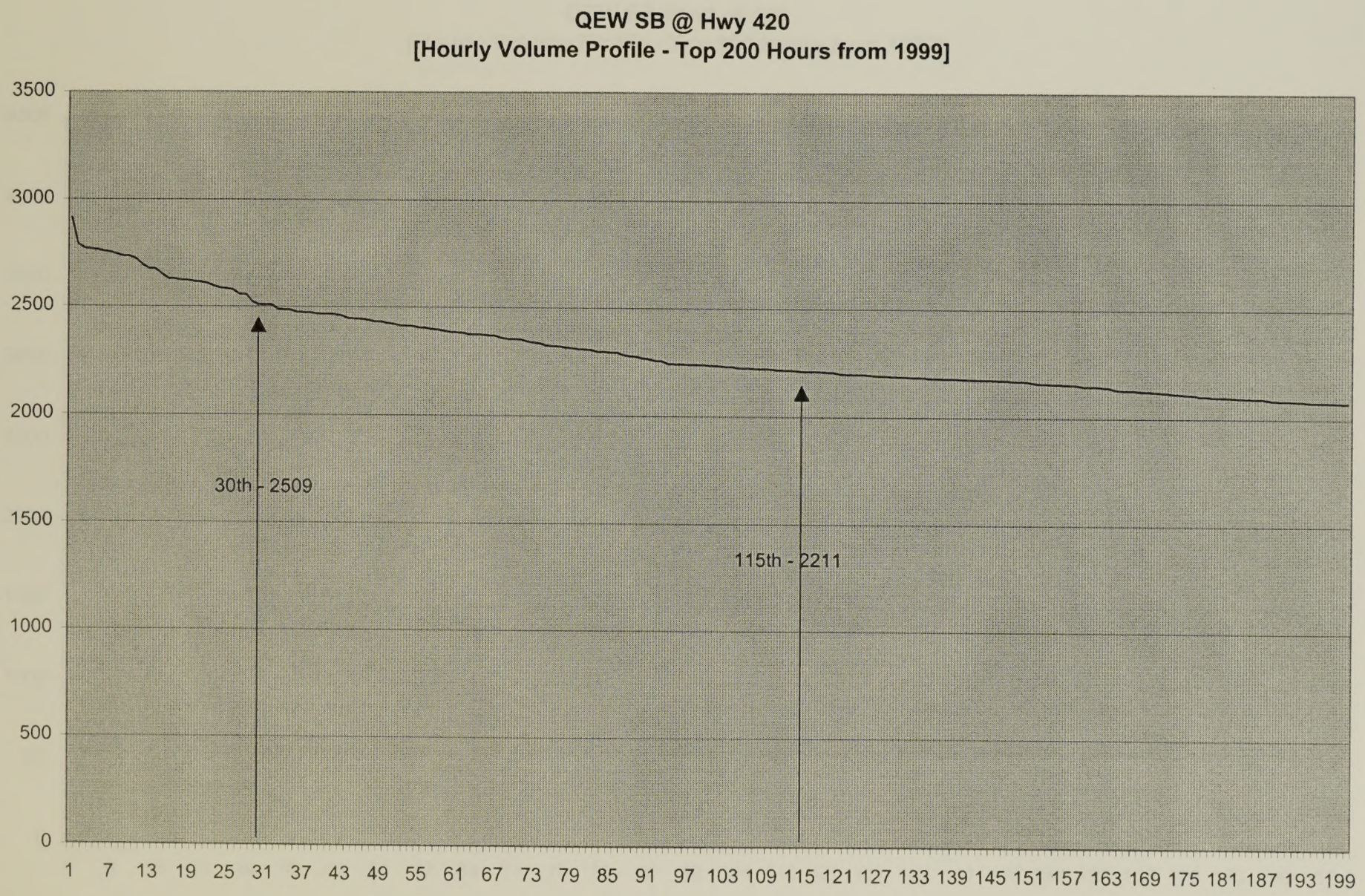

Highway 406 Southbound
[Hourly Volume Profile - Top 200 Hours from 1999]
1200
1000
800
600
400
200
0
9th - 1038
30th - 1003
43rd - 989
115th - 924
1 8 15 22 29 36 43 50 57 64 71 78 85 92 99 106 113 120 127 134 141 148 155 162 169 176 183 190 197

Highway 406 NB
[Hourly Volume Profile - Top 200 Hours from 1999]

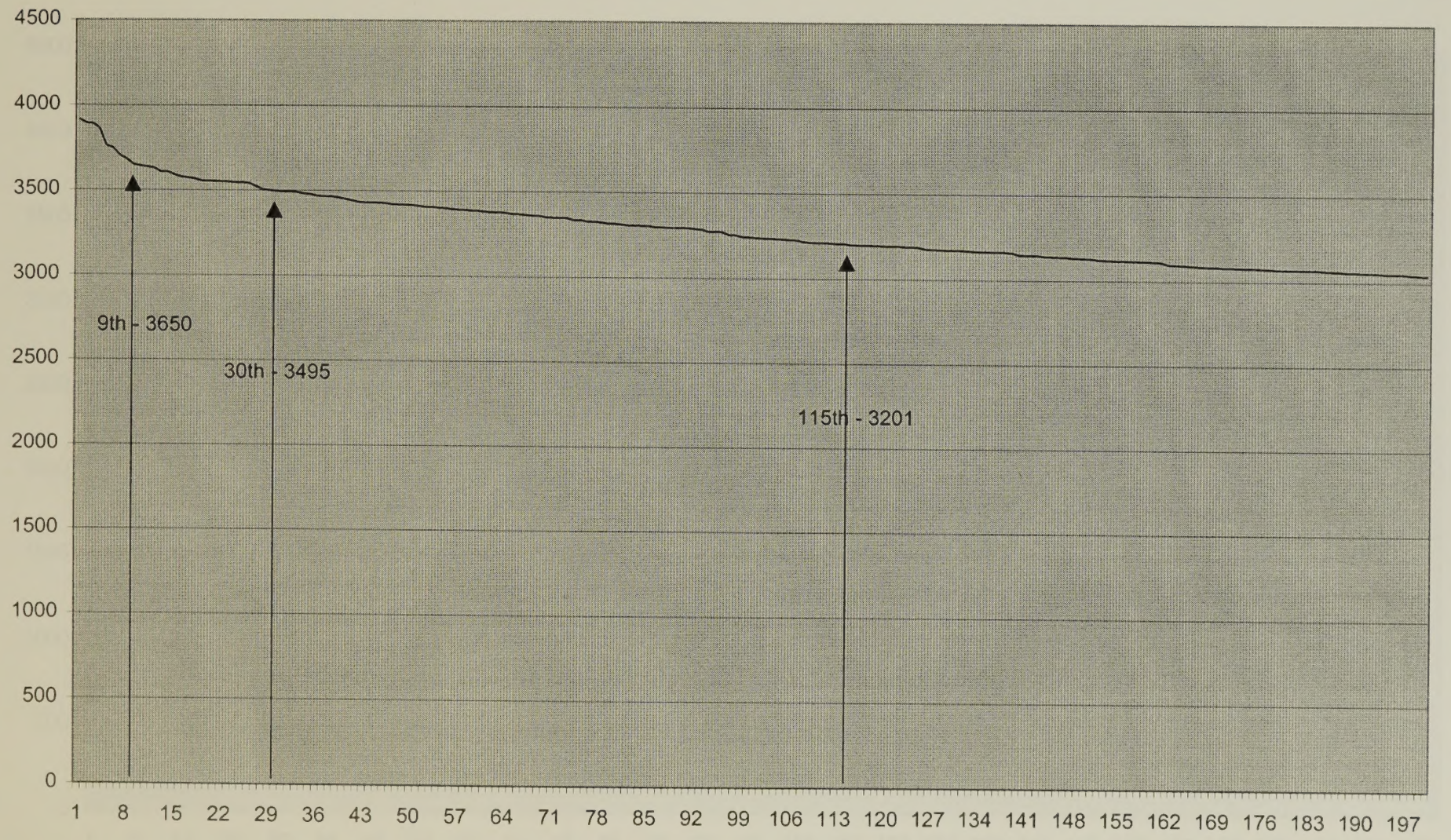


QEW NB @ Hwy 420
[Hourly Volume Profile - Top 200 Hours from 1999]

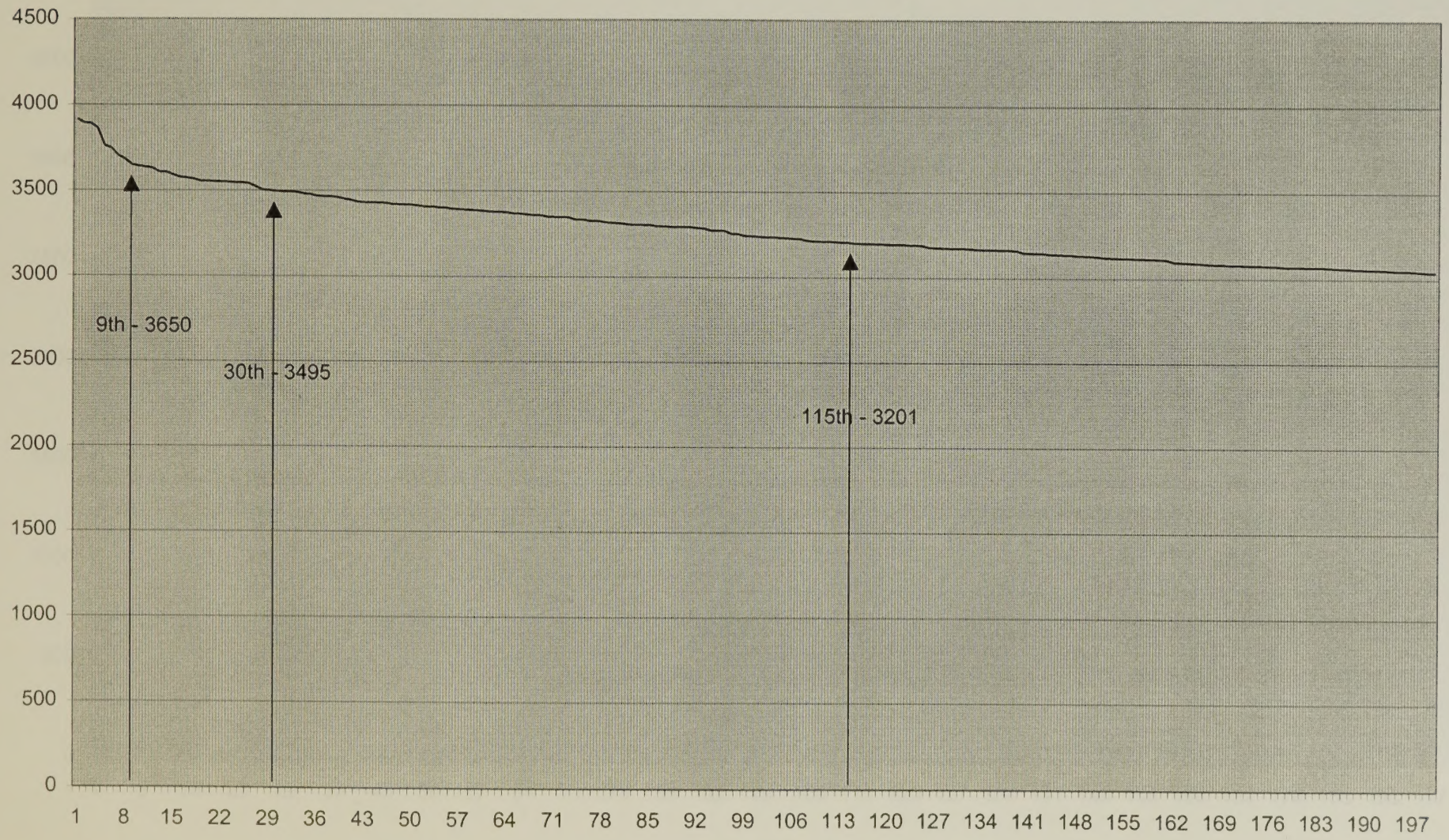



QEW SB @ Hwy 420
[Hourly Volume Profile - Top 200 Hours from 1999]
3500
3000
2500
2000
1500
1000
500
0
30th - 2509
115th - 2211
1 7 13 19 25 31 37 43 49 55 61 67 73 79 85 91 97 103 109 115 121 127 133 139 145 151 157 163 169 175 181 187 193 199

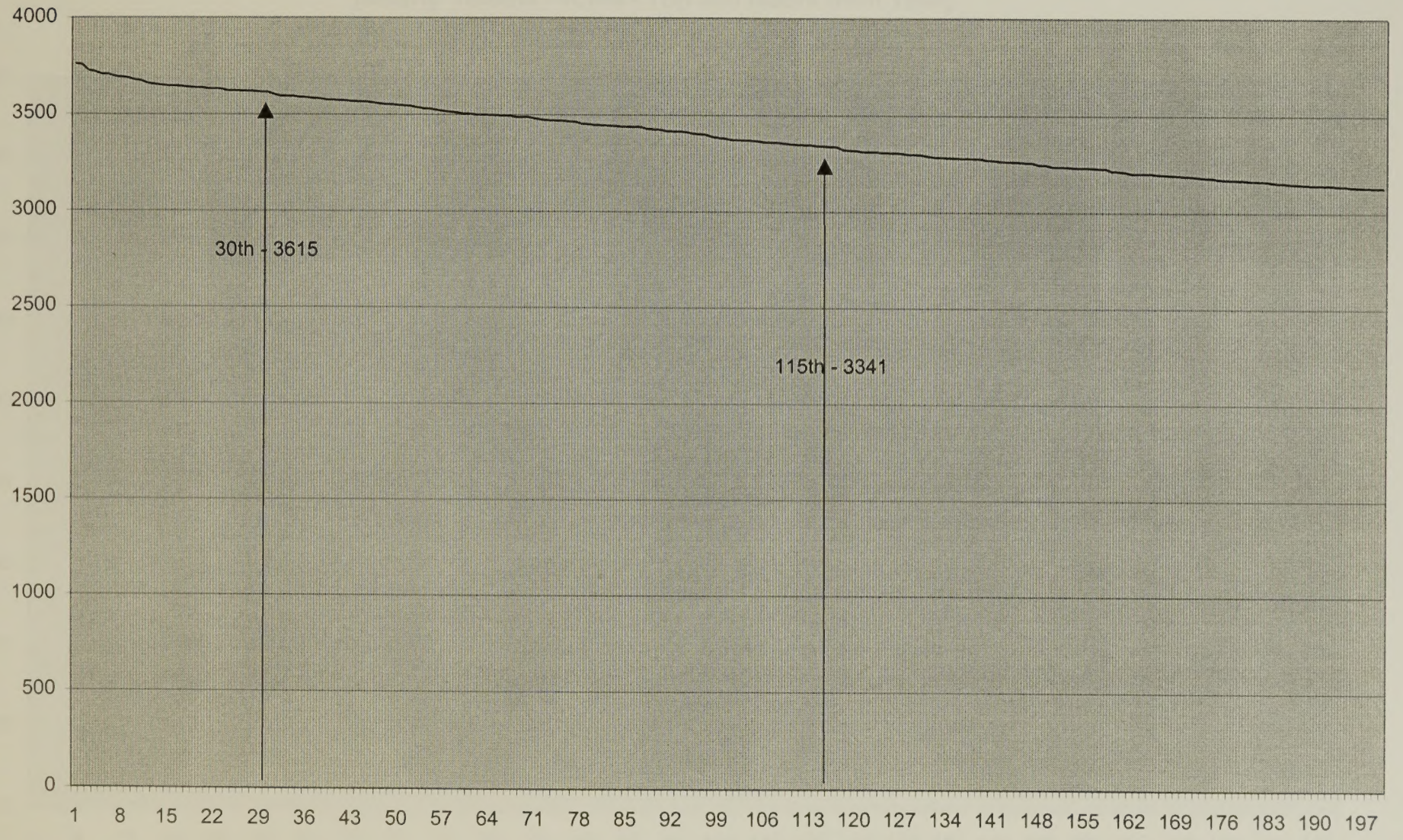
QEW EB West of 406
[Hourly Volume Profile - Top 200 Hours from 1999]



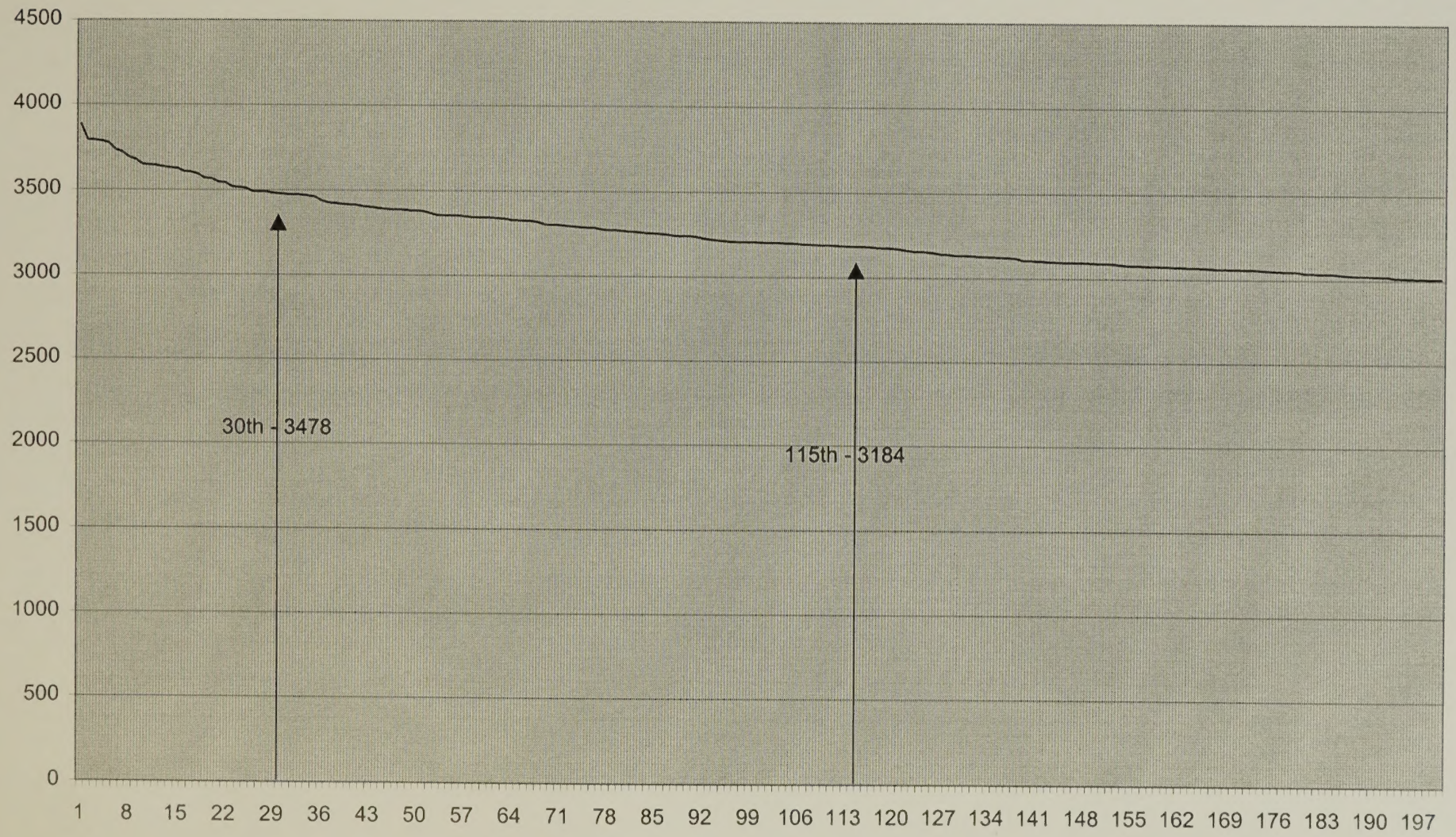
QEW EB West of 406
[Hourly Volume Profile - Top 200 Hours from 1999]



QEW EB west of Glendale
[Hourly Volume Profile - Top 200 Hours from 1999]



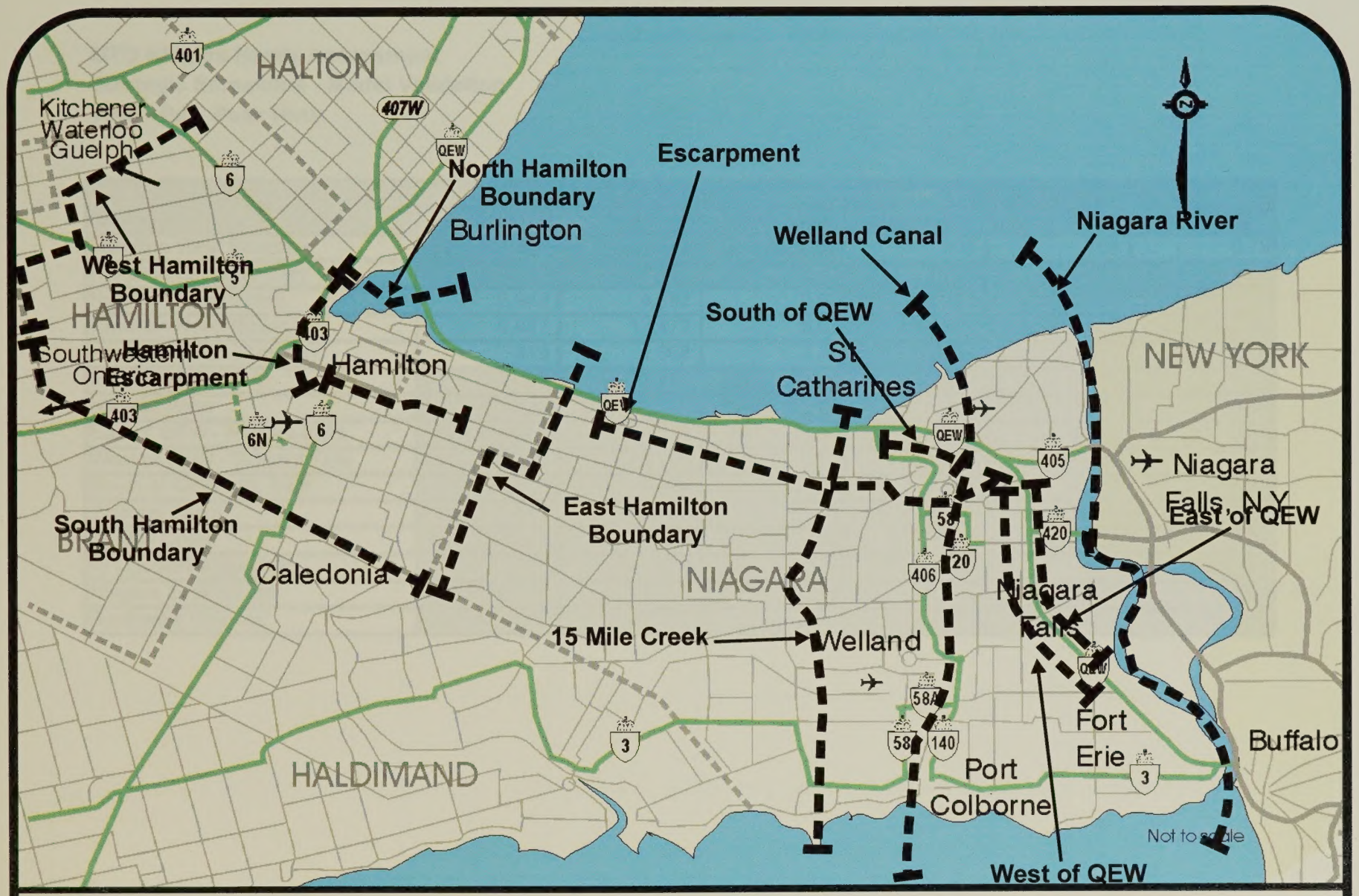
QEW WB west of Glendale
[Hourly Volume Profile - Top 200 Hours from 1999]



APPENDIX G

Model Calibration

APPENDIX G
MODEL CALIBRATION



Screenlines

MTO Niagara Needs Assessment
Strategic Screenline - Model Validation
2000 - P.M. Peak Hour

Screenline	Northbound/Eastbound			Southbound/Westbound		
	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs
Hamilton West Boundary	1,503	1,782	0.84	609	769	0.79
Hamilton East Boundary	4,239	3,850	1.10	2,809	2,517	1.12
Hamilton Escarpment	2,943	4,682	0.63	5,943	5,554	1.07
Hamilton North Boundary	9,057	13,477	0.67	14,973	16,309	0.92
Hamilton South Boundary	819	1,868	0.44	3,084	3,976	0.78
North of Highway 5	2,766	2,426	1.14	2,372	2,044	1.16
Niagara River	1,723	1,729	1.00	1,801	2,164	0.83
East of QEW - Niagara Falls	4,964	4,966	1.00	4,121	4,915	0.84
West of QEW - Niagara Falls	3,288	3,930	0.84	3,217	3,534	0.91
South of QEW - St. Cath	7,109	5,984	1.19	4,961	5,418	0.92
Welland Canal	7,613	6,799	1.12	6,282	7,149	0.88
15 Mile Creek	3,867	3,332	1.16	3,745	2,965	1.26
W Lincoln/Pelham Bdry	696	374	1.86	735	384	1.91
Niagara Escarpment	4,118	4,905	0.84	5,358	5,131	1.04
Southwest Gateway	388	395	0.98	481	488	0.99

MTO Niagara Needs Assessment
Strategic Screenline - Model Validation
2000 - P.M. Peak Hour

Screenline	Link	Northbound/Eastbound						Southbound/Westbound					
		Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs
Region of Hamilton-Wentworth													
Hamilton West Boundary	Highway 6	643	974	0.66				18	11	1.61			
	RR 35	148	253	0.58				46	46	1.00			
	RR 97	-	208	-				-	104	-			
	Highway 8	677	312	2.17				415	478	0.87			
	Highway 5	36	36	1.00				130	130	1.00			
	Governors Rd	-	0	-	1,503	1,782	0.84	-	0	-	609	769	0.79
Hamilton East Boundary	Highway QEW	2,654	2600	1.02				1,670	1483	1.13			
	S. Service Rd	277	125	2.22				66	134	0.49			
	Highway 8	293	298	0.99				329	265	1.24			
	Ridge Rd.	248	149	1.67				29	23	1.28			
	Mud Street	520	480	1.08				497	491	1.01			
	Highway 20	223	177	1.26				197	110	1.79			
	Binbrook Road	23	22	1.02	4,239	3,850	1.10	21	12	1.80	2,809	2,517	1.12
Hamilton Escarpment	Sydenham Rd												
	Highway 8												
	Governor's Rd												
	Highway 2				-	-	#DIV/0!				-	-	#DIV/0!
	Highway 403												
	Beckett Dr	625	1099	0.57				906	1479	0.61			
	James St	156	441	0.35				957	1372	0.70			
	Claremont Access												
	Jolley Cut	981	1551	0.63				1,831	928	1.97			
	Sherman Access												
	Kennilworth Ave	852	1083	0.79	2,614	4,174	0.63	1,569	1011	1.55	5,263	4,790	1.10
	Red Hill Creek Expressway												
	Mt. Albion Rd	329	508	0.65				679	764	0.89			
	Centennial Parkway				329	508	0.65				679	764	0.89
Hamilton North Boundary	Beach Blvd	191	354	0.54				17	301	0.06			
	QEW	2,411	4881	0.49				4,121	4582	0.90			
	York Rd (Plains Rd E)	201	814	0.25				577	483	1.19			
	Highway 403	4,163	5343	0.78				4,999	5459	0.92			
	Mill Street												
	Highway 5												
	Parkside Dr												
	6th Concession												
	7th Concession												
	Carlisle Rd												
	11 th Concession												
	Campbellville Rd												
	Highway 401	2,092	2085	1.00	9,057	13,477	0.67	5,260	5483	0.96	14,973	16,309	0.92
Hamilton South Boundary	Jerseyville Rd												
	Highway 2/53	411	1456	0.28				1,320	2236	0.59			
	Carluke St												
	Highway 6	305	308	0.99				1,345	1345	1.00			
	Tyensdale												
	Blackheath Rd												
	Highway 56	103	104	0.99	819	1,868	0.44	419	395	1.06	3,084	3,976	0.78
North of Highway 5	Milborough	518	303	1.71				151	48	3.13			
	Evans Rd	111	303	0.37				206	92	2.25			
	Main St	232	288	0.81				91	77	1.18			
	Hamilton St	345	362	0.95				218	344	0.63			
	Highway 6	828	654	1.27				909	861	1.06			
	Millgrove Side Road												
	Brock Rd N												
	Westover Rd												
	Highway 8	637	483	1.32				665	602	1.10			
	Woodhill Rd	93	33	2.86				132	20	6.47			
	Sheffield Rd				2,766	2,426	1.14				2,372	2,044	1.16

MTO Niagara Needs Assessment
Strategic Screenline - Model Validation
2000 - P.M. Peak Hour

Screenline	Link	Northbound/Eastbound						Southbound/Westbound					
		Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs
Region of Niagara													
Niagara River	Queenston/Lewiston Bridge	397	400	0.99				297	501	0.59			
	Whirlpool Bridge	151	140	1.08				165	65	2.54			
	Rainbow Bridge	371	470	0.79				402	572	0.70			
	Peace Bridge	805	719	1.12	1,723	1,729	1.00	937	1026	0.91	1,801	2,164	0.83
East of QEW	Hwy 405	716	593	1.21				471	704	0.67			
	Mountain Rd	339	491	0.69				232	357	0.65			
	Thorold Stone Rd	864	1064	0.81				468	1021	0.46			
	Hwy 420	1,415	1071	1.32				1,717	1208	1.42			
	Lundy's Lane	600	639	0.94				518	590	0.88			
	McLeod Rd	580	989	0.59				446	913	0.49			
	Lyons Creek Rd	451	119	3.80				269	123	2.19			
	Sodom Rd				4,964	4,966	1.00				4,121	4,915	0.84
West of QEW	Mountain Rd	209	222	0.95				314	251	1.25			
	Thorold Stone Rd	720	1156	0.62				594	1038	0.57			
	Hwy 420	422	490	0.86				613	526	1.16			
	Lundy's Lane / Hwy 20	600	639	0.94				518	590	0.88			
	McLeod Rd	699	931	0.75				459	620	0.74			
	Lyons Creek Rd	360	294	1.22				367	333	1.10			
	Sodom Rd	278	199	1.40	3,288	3,930	0.84	352	177	1.99	3,217	3,534	0.91
South of QEW - St. Cath	Martindale Rd	688	593	1.16				764	638	1.20			
	Ontario St.	624	956	0.65				196	744	0.26			
	Lake St	1,051	1018	1.03				827	865	0.96			
	on/off ramp												
	Geneva St	1,309	711	1.84				1,337	711	1.88			
	offramp												
	Niagara St	1,507	931	1.62				814	644	1.26			
	Welland Ave	679	758	0.90				495	758	0.65			
	on ramp												
	Bunting Rd	781	788	0.99				124	788	0.16			
	Dieppe Rd												
	Cushman Rd												
	Government Rd	471	230	2.05	7,109	5,984	1.19	404	271	1.49	4,961	5,418	0.92
Welland Canal North	Lakeshore Rd	500	271	1.84				610	333	1.83			
	Carlton St	512	106	4.83				405	114	3.54			
	QEW	2,253	1989	1.13				1,807	2168	0.83			
	Queenston St	779	555	1.40				676	620	1.09			
	Glendale Ave	282	257	1.10	4,326	3,179	1.36	69	290	0.24	3,569	3,525	1.01
Welland Canal Central	Hwy 58	1,176	1265	0.93				744	1172	0.64			
	Hwy 20	626	452	1.38	1,802	1,717	1.05	618	444	1.39	1,363	1,616	0.84
Welland Canal South	East Main St	613	786	0.78				655	861	0.76			
	Townline Tunnel Rd (Hwy 58A)	497	309	1.61				418	309	1.35			
	Main St E (Hwy 3)	212	500	0.42				99	553	0.18			
	Clarence St	163	308	0.53	1,485	1,903	0.78	178	285	0.62	1,351	2,008	0.67
15 Mile Creek	QEW	2,544	2919	0.87				2,290	2574	0.89			
	Fourth Ave	642	203	3.17				668	219	3.04			
	St. Paul St	374	104	3.59				445	120	3.72			
	Eighth Ave	307	106	2.90	3,867	3,332	1.16	343	52	6.60	3,745	2,965	1.26
W Lincoln/Pelham Bdry	Sixteen Rd	172	28	6.24				222	26	8.40			
	Hwy 20	278	174	1.60				257	186	1.38			
	Canboro Rd												
	Webber Rd	246	173	1.43	696	374	1.86	256	172	1.49	735	384	1.91

MTO Niagara Needs Assessment
Strategic Screenline - Model Validation
2000 - P.M. Peak Hour

Screenline	Link	Northbound/Eastbound						Southbound/Westbound					
		Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs	Modelled	Abj Obs	Mod/Obs
Escarpment Central	Government Rd	409	256	1.59				432	231	1.87			
	Merritt St	415	454	0.91				367	335	1.10			
	Burleigh Dr												
	Hwy 406	2,000	2143	0.93				2,231	2479	0.90			
	Glenridge Ave	278	679	0.41	3,103	3,533	0.88	325	453	0.72	3,355	3,498	0.96
Escarpment West	Pelham Rd	104	112	0.93				459	93	4.96			
	First St Louth	344	211	1.63				331	269	1.23			
	Glen Rd	59	35	1.69				182	51	3.59			
	Victoria Ave	271	341	0.79				318	329	0.97			
	Campden Rd	22	176	0.13				40	221	0.18			
	Beamsville Rd	38	22	1.77				198	161	1.23			
	Thirty St	47	76	0.62				129	43	2.98			
	Park Rd	41	78	0.53				109	95	1.15			
	Mountain Rd	88	322	0.27	1,016	1,373	0.74	238	372	0.64	2,003	1,633	1.23
Southwest Gateway	Caistorville Rd	-	40	-				-	92	-			
	Smithville Rd	62	22	2.80				146	54	2.71			
	Canboro Rd	-	45	-				-	56	-			
	RR 15	17	61	0.29				57	61	0.93			
	RR 7	98	13	7.45				70	12	5.77			
	Highway 3	180	184	0.98				192	184	1.05			
	Lakeshore Rd	30	31	0.98	388	395	0.98	16	30	0.55	481	488	0.99

APPENDIX H

International Bridge Crossings

Appendix H
International Bridge forecasts

Appendix H - International Traffic Forecasts

International truck and auto traffic across the Niagara Frontier is an important component of travel demand on the provincial and municipal road network. Truck travel has grown substantially at the Peace Bridge and Queenston-Lewiston Bridge with the growth in international trade between Ontario and the U.S. in the last decade. On the other hand, passenger vehicle traffic across these bridges and the Rainbow and Whirlpool bridges has not yet returned to the volumes experienced during the early 1990's.

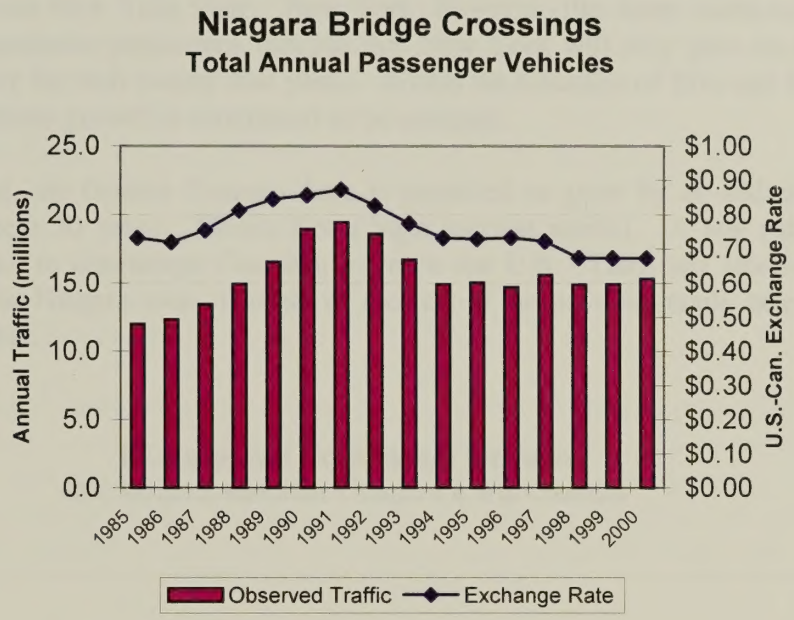
Regression models were developed for both truck and passenger vehicle traffic using key input variables.

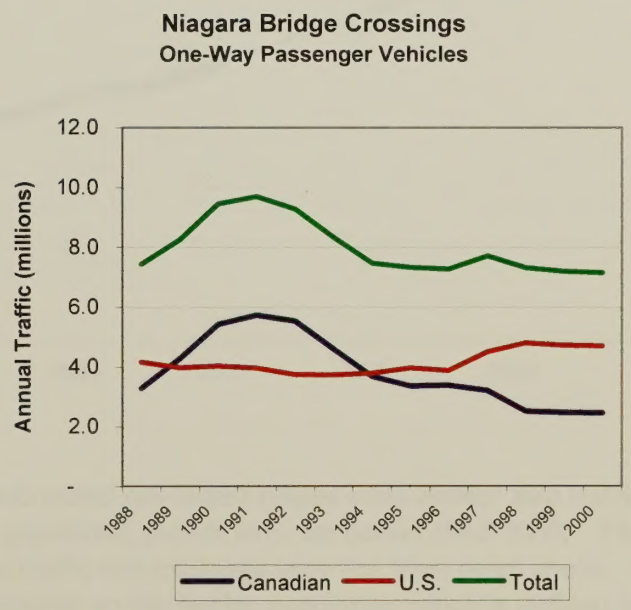
Auto Mode

Past trends suggest that Canadian cross-border tourists and shoppers are highly dependent on the value of the Canadian dollar. In contrast, U.S travelers appear not to be affected by the valuation as the price differential is generally in their favour.

While a slight increase in annual American travel to Niagara Falls can be attributed to the opening of the interim casino in 1996, the decrease in Canadian cross-border travel has negated any significant increase. Indeed, total bridge crossing passenger traffic has not yet come back to levels experienced in the early 1990's when the Canadian dollar was around $0.90U.S. The falling Canadian dollar clearly has an affect on the propensity for Canadians to vacation and shop in the United States.

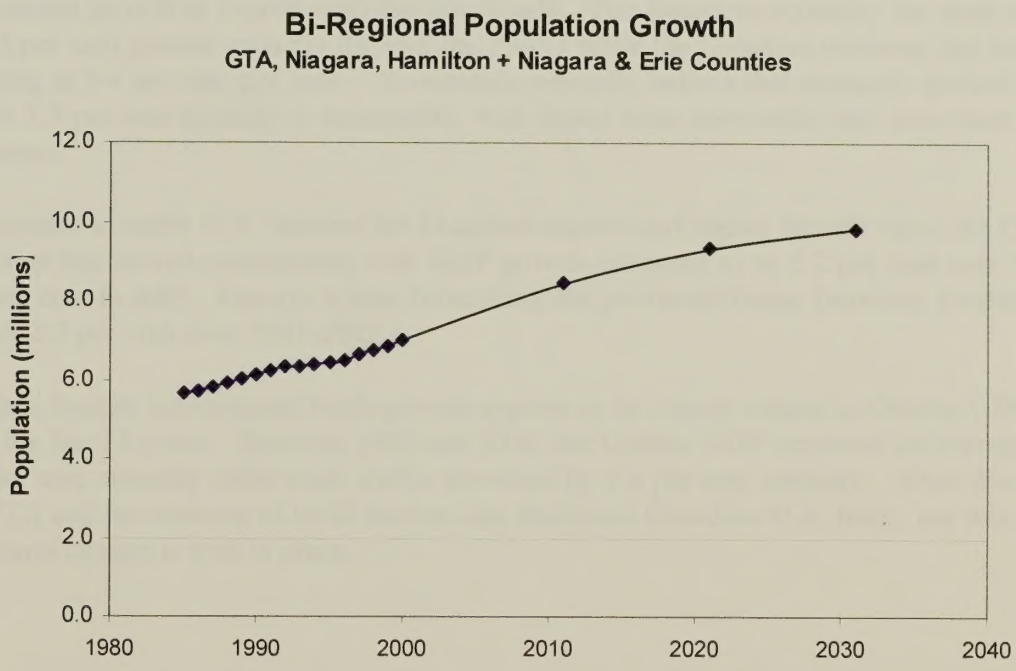
With a high Canadian dollar value, a greater number of Canadians are attracted to the U.S.: during the early 1990's, approximately two-thirds of the cross-border traffic was Canadian. By the year 2000, the Canadian dollar had decreased to $0.67 U.S. resulting in four million fewer Canadian vehicle trips to the U.S. American vehicles presently comprise two-thirds of all cross-border passenger vehicle traffic.


Niagara Bridge Crossings
Total Annual Passenger Vehicles
Annual Traffic (millions)
25.0
20.0
15.0
10.0
5.0
0.0
$1.00
$0.90
$0.80
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$0.00
U.S.-Can. Exchange Rate
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Observed Traffic
Exchange Rate


Niagara Bridge Crossings
One-Way Passenger Vehicles
Annual Traffic (millions)
12.0
10.0
8.0
6.0
4.0
2.0
-
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Canadian
U.S.
Total

Another key factor is the tourism market. A large number of American travellers (75%) currently come from New York State. New York, however, like many north-eastern states is not growing. Population projections indicate that New York will only gain an additional one million people over the next twenty-five years. Within the Counties of Erie and Niagara across the border, population growth is anticipated to be minimal.

On the other hand, the Greater Toronto Area is projected to grow by an additional 3 million people over the next 30 years. Herein lies a huge tourism market. A low valued Canadian dollar will continue to discourage Canadian travel to the U.S. Thus, any intervening tourism opportunities in the Niagara area, Toronto or the rest of the province could take advantage of this market potential.



The passenger vehicle model developed relates cross-border auto traffic Canada-United States exchange rates and population growth over the period 1985-2000. The close relationship between auto bridge traffic and exchange rates has been noted above. Cross-border tourism and related travel depends on the market population which is defined here as the population for the bi-national region – the GTA, Niagara and Hamilton and the Counties of Niagara and Erie in New York.

The calibrated model indicates a very high "goodness-of-fit with the observed data over the 1985-2000 period. Average variation is in the order of 3%. The model is therefore considered to be reasonable for forecasting purposes.

In view of the sensitivity to the valuation of the Canadian dollar, a range of exchange rate scenarios or "possible futures" are considered. These charts are provided in Appendix H – Future Bridge Growth.

The substantial increase in GTA population underlies the cross-border passenger vehicle forecast. With a low Canadian dollar, Niagara crossing traffic is projected to grow by 1.6% annually to roughly 28 million by 2031. If the Canadian dollar returns to $0.90, an additional 10 million cross-border passenger vehicle trips are forecast, a large number being Canadian trips to the United States. This represents a high growth rate of 2.7% per year to 2031.

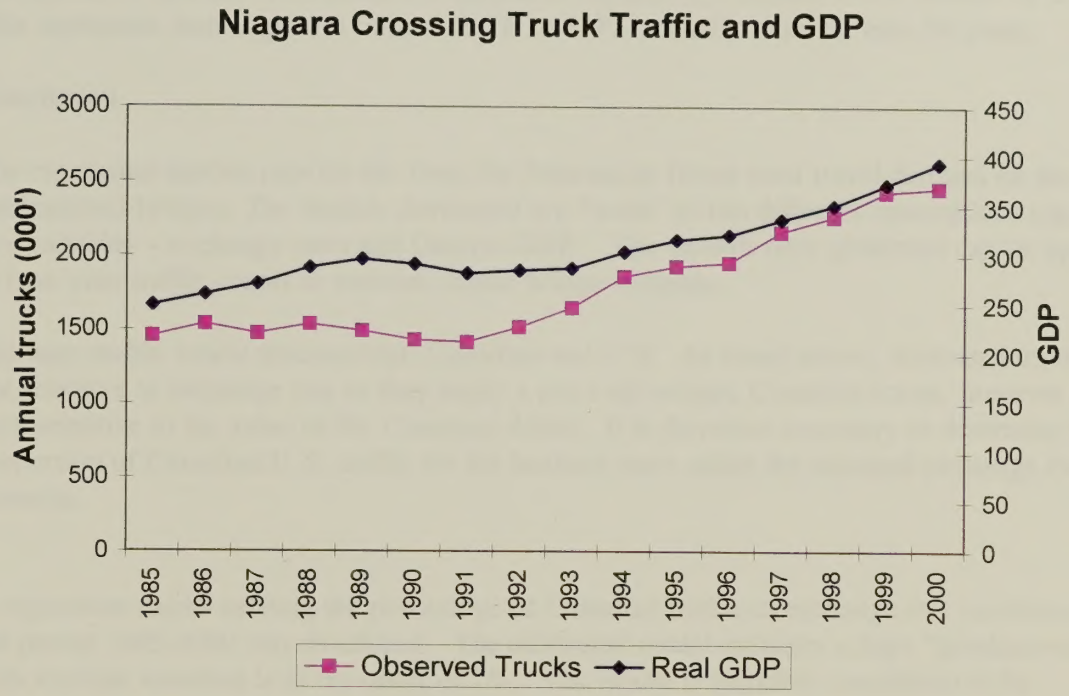
Truck Model

Past trends suggest that cross-border truck traffic is dependent on volume of international trade between Ontario and the United States.

Strong U.S. consumer demand and the attractively priced Canadian dollar underlie the 8 per cent annual growth in exports over the last decade. The American economy has been running at 4.3 per cent growth annually through the 1990's while the Canadian economy has been growing at 3-4 per cent per year. Economists generally believe that economic growth between 2.5 to 3.5 per cent annually is sustainable, with higher rates achievable only over short durations.

In response to softer U.S. demand for Canadian exports and higher interest rates, the Canadian economy has slowed considerably with GDP growth estimated to be 2.2 per cent over 2001 and 3.0 per cent in 2002. Ontario is now forecasting the provincial Gross Domestic Product (GDP) at 2 to 2.5 per cent over 2001-2002.

Niagara frontier international truck growth appears to be closely related to Ontario GDP growth over the last 15 years. Between 1985 and 2000, the Ontario GDP increased an average rate of 3.8 per cent annually while truck traffic increased by 4.6 per cent annually. Over this period, NAFTA and the removal of tariff barriers has facilitated Canadian-U.S. trade, but this structural change is now in place.



The truck model developed relates cross-border truck to Canada-United States exchange rates and Ontario GDP over the period 1985-2000.

The calibrated model indicates a very high "goodness-of-fit with the observed data over the 1985-2000 period. Average variation is in the order of 2%. The model is therefore considered to be reasonable for forecasting purposes.

In contrast to the auto traffic model, the truck model is not nearly as sensitive to exchange rates and is highly dependent on Ontario GDP. As Ontario-U.S. exports represent 50% of provincial GDP, growth in Ontario GDP is a useful variable to stand in for exports and imports as various growth scenarios may be tested.

While truck growth has exceeded average GDP growth in recent years, this may not continue in the future. Further, economic growth at 3.5 per cent would not appear sustainable over the long term. Lastly, the price competitiveness of Canadian products is largely dependent on the lower Canadian dollar rather than significant gains in productivity. A significant increase in the valuation of the Canadian dollar, could also affect trade with the U.S. and, therefore truck traffic.

Niagara crossing truck projections may therefore be based on a number of "possible futures" as show in the charts contained in Appendix H – Future Bridge Growth.. These include a continuation of recent high GDP growth of 3.5% or a more conservative growth rate of 2.5% annually. Alternatively, if the value of the Canadian dollar increases, truck growth will be at lower rate.

Based on "mid-growth" forecast scenarios, annual truck volumes crossing the frontier are anticipated to increase from about 2.5 million to between 5.5 million to 6.5 million by 2031. This represents annual growth rates of 2.3% to 3.9% annually over the next 30 years.

Conclusion

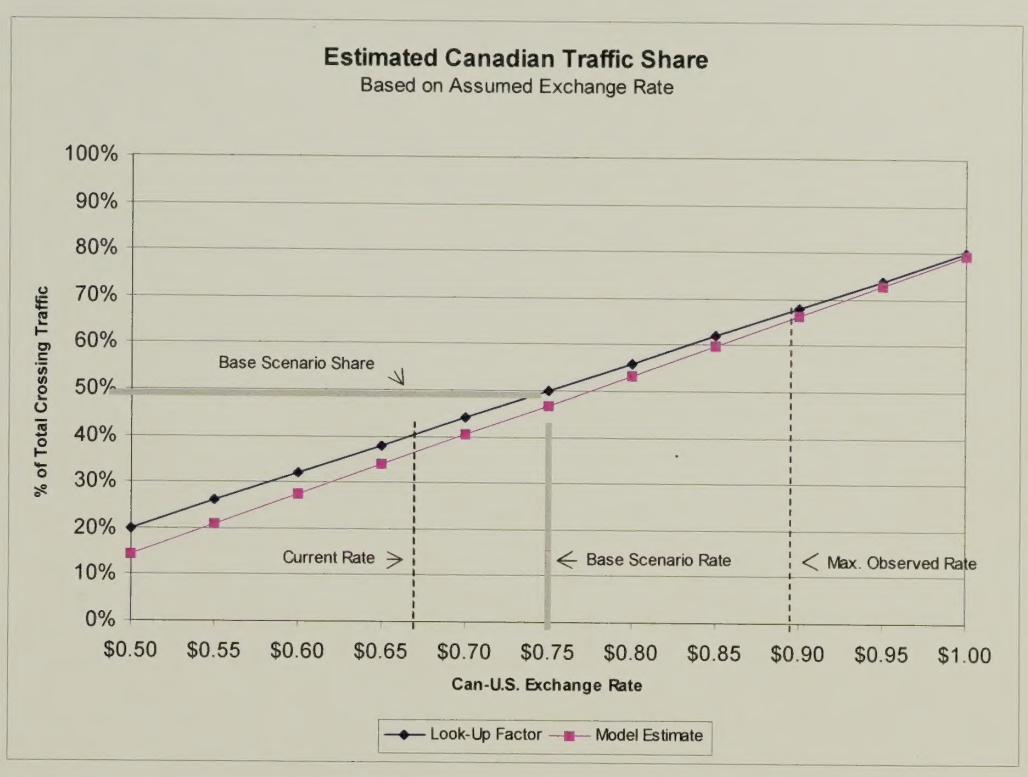
The regression models provide the basis for forecasting future *total* travel demand on the international bridges. The models developed are "tools" to test different assumptions regarding key variables – exchange rates and Ontario GDP. The growth rates generated can be applied to base year traffic counts to estimate future bridge volumes.

The auto traffic model forecast total Canadian and U.S. As noted above, American travel is not sensitive to exchange rate as they enjoy a price advantage; Canadian travel, however, is very sensitive to the value of the Canadian dollar. It is therefore necessary to determine the proportion of Canadian/U.S. traffic for the horizon years under the assumed exchange rate scenario.

A regression model relating the percentage of Canadian traffic to exchange rate variation over the period 1985-2000 was developed. The calibrated model indicates a high "goodness-of-fit with average variation is in the order of 7%. The model is therefore considered to be reasonable for estimation purposes.

In order to make the model more useable, however, the relationship was adjusted to constrain the proportion of Canadian travel to between 20% and 80% of total cross-border travel. It should be noted, however, that the model was calibrated using market shares between 35% to 65% only.

Assuming that an exchange rate of $0.75 could be achieved over the longer term results in a mid-growth traffic forecast for the bridges. Thus, while the Canadian share of total traffic was 34% in 1999 (exchange rate of $0.67), the estimated Canadian traffic share for an exchange rate of $0.75 is approximately 50%. The same market share was assumed for Canadian and American visitation to Niagara Falls.


Estimated Canadian Traffic Share
Based on Assumed Exchange Rate
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of Total Crossing Traffic
Base Scenario Share
Current Rate
Base Scenario Rate
Max. Observed Rate
$0.50
$0.55
$0.60
$0.65
$0.70
$0.75
$0.80
$0.85
$0.90
$0.95
$1.00
Can-U.S. Exchange Rate
Look-Up Factor
Model Estimate

APPENDIX H
REGRESSION ANALYSIS

NIAGARA CROSSING PASSENGER VEHICLE PROJECTIONS

Year	Predicted Ann (000's)	Observed Ann (000's)	Can.-U.S. Exchange	Total Population	GGH Population	Niagara/Erie Cty Population
1985	**12,125**	12,010.2	0.732	5,616.7	4,424.8	1,191.9
1986	**11,933**	12,349.0	0.720	5,711.2	4,526.6	1,184.6
1987	**13,525**	13,435.0	0.754	5,810.5	4,630.7	1,179.8
1988	**16,051**	14,922.6	0.812	5,918.4	4,737.2	1,181.2
1989	**17,611**	16,563.7	0.845	6,031.8	4,846.1	1,185.7
1990	**18,360**	18,952.2	0.857	6,146.9	4,957.6	1,189.3
1991	**19,267**	19,441.9	0.873	6,256.2	5,071.6	1,184.6
1992	**17,771**	18,595.0	0.827	6,313.6	5,133.7	1,179.9
1993	**16,046**	16,713.7	0.775	6,361.7	5,186.6	1,175.1
1994	**14,673**	14,922.6	0.732	6,410.4	5,240.0	1,170.4
1995	**14,852**	15,051.4	0.729	6,459.7	5,294.0	1,165.7
1996	**15,280**	**14,697.8**	**0.733**	**6,504.8**	**5,343.8**	1,161.0
1997	**15,566**	15,593.9	0.722	6,629.9	5,473.7	1,156.2
1998	**14,408**	14,895.7	0.674	6,753.3	5,601.8	1,151.5
1999	**15,089**	14,917.4	0.673	6,875.0	5,732.9	1,142.1
2000	**15,836**	15,332.3	0.673	7,004.4	5,867.0	1,137.4

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.972429859
R Square	0.945619831
Adjusted R Square	0.937253651
Standard Error	534.3373356
Observations	16

ANOVA

	df	SS	MS	F	Significance F
Regression	2	64543188.24	32271594.12	113.0288679	6.03064E-09
Residual	13	3711713.047	285516.3882		
Total	15	68254901.29			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-35623.26359	3612.425959	-9.861313144	2.11523E-07	-43427.4339	-27819.09328	-43427.4339	-27819.09328
X Variable 1	34092.56504	2363.94621	14.42188697	2.23973E-09	28985.57073	39199.55936	28985.57073	39199.55936
X Variable 2	4.01548149	0.381303147	10.53094244	9.84027E-08	3.191726283	4.839236698	3.191726283	4.839236698

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	11886.26696	123.9330395	0.24914119
2	11856.50074	492.4992622	0.990065705
3	13414.43034	20.56966494	0.041350965
4	15825.09278	-902.4927826	-1.814271048
5	17405.72555	-842.0255527	-1.692714459
6	18276.86322	675.3367819	1.357621906
7	19261.2364	180.6636033	0.363186001
8	17923.38513	671.6148651	1.350139778
9	16343.92725	369.7727519	0.743349987
10	15073.48943	-150.8894317	-0.30333132
11	15168.96373	-117.5637281	-0.236337035
12	15486.28981	-788.4898069	-1.585092154
13	15613.88771	-19.98771039	-0.040181068
14	14472.79219	422.9078112	0.850166797
15	14927.99096	-10.59096086	-0.021290889
16	15457.57781	-125.2578068	-0.251804354

NIAGARA CROSSING PASSENGER VEHICLE PROJECTIONS

PASSENGER VEH. (000's)			Coefficient	Population	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00 (Current)	$ 0.67 (Base Scenario)	$ 0.75
		Intercept	-35623.26		-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26
		Exchange	34092.57		20455.5	23864.8	27274.1	30683.3	34092.6	22944.3	25569.4
		Population	4.02	8427.0	33838.6	33838.6	33838.6	33838.6	33838.6	33838.6	33838.6
					18670.9	22080.2	25489.4	28898.7	32307.9	21159.7	23784.8
GGH	7262.0	2000 Veh	15332.3		21.8%	44.0%	66.2%	88.5%	110.7%	38.0%	55.1%
US	1165.0	2000 Pop	7004.4								
Total	8427.0										
	20.3%										
	1.7%										

2011

Elasticity	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67	$ 0.75
Exch 1%	204.6	238.6	272.7	306.8	340.9	229.4	255.7
	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Pop 1%	338.4	338.4	338.4	338.4	338.4	338.4	338.4
	1.8%	1.5%	1.3%	1.2%	1.0%	1.6%	1.4%
	18332.5	21741.8					

PASSENGER VEH. (000's)			Coefficient	Population	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00 (Current)	$ 0.67	$ 0.75 (Base Scenario)
		Intercept	-35623.26		-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26
		Exchange	34092.57		20455.5	23864.8	27274.1	30683.3	34092.6	22944.3	25569.4
		Population	4.02	9274.7	37242.3	37242.3	37242.3	37242.3	37242.3	37242.3	37242.3
					22074.6	25483.8	28893.1	32302.4	35711.6	24563.3	27188.5
GGH	8083.9	2000 Veh	15332.3		44.0%	66.2%	88.4%	110.7%	132.9%	60.2%	77.3%
US	1190.8	2000 Pop	7004.4								
Total	9274.7										
	32.4%										
	1.4%										

2021

Elasticity	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67	$ 0.75
Exch 1%	204.6	238.6	272.7	306.8	340.9	229.4	255.7
	0.9%	0.9%	0.9%	0.9%	1.0%	0.9%	0.9%
Pop 1%	372.4	372.4	372.4	372.4	372.4	372.4	372.4
	1.7%	1.5%	1.3%	1.2%	1.0%	1.5%	1.4%

PASSENGER VEH. (000's)			Coefficient	Population	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00 (Current)	$ 0.67	$ 0.75 (Base Scenario)
		Intercept	-35623.26		-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26	-35623.26
		Exchange	34092.57		20455.5	23864.8	27274.1	30683.3	34092.6	22944.3	25569.4
		Population	4.02	9806.1	39376.2	39376.2	39376.2	39376.2	39376.2	39376.2	39376.2
					24208.5	27617.7	31027.0	34436.3	37845.5	26697.2	29322.4
GGH	8525.8	2000 Veh	15332.3		57.9%	80.1%	102.4%	124.6%	146.8%	74.1%	91.2%
US	1217.0	2000 Pop	7004.4	cmpd avg							
Total	9742.8										
	39.1%										
	1.1%										

2031

Elasticity	$ 0.60	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67	$ 0.75
Exch 1%	204.6	238.6	272.7	306.8	340.9	229.4	255.7
	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Pop 1%	393.8	393.8	393.8	393.8	393.8	393.8	393.8
	1.6%	1.4%	1.3%	1.1%	1.0%	1.5%	1.3%

NIAGARA CROSSING CANADIAN & U.S. PASSENGER VEHICLE PROJECTIONS

		Base Scenario				Parity Scenario				Curent Exchange Rate Low' Scenario	
		Observed		Estimated	Observed	Observed		Observed		Observed	
2000	Can%	**0.34**		0.37	0.34	0.34		0.34		0.34	
	Can	5,213.0		5,673.0	5,213.0	5,213.0		5,213.0		5,213.0	
	US	10,119.3		9,659.4	10,119.3	10,119.3		10,119.3		10,119.3	
	Total	15,332.3		15,332.3	15,332.3	15,332.3		15,332.3		15,332.3	
Assumed Exchange Rate		**$ 0.75**			**$ 0.80**	**$ 0.90**		**$ 1.00**		**$ 0.67**	
2011	Can%	0.5	Growth		0.56	0.65	Growth	0.65	Growth	0.34	Growth
	Can	11,892.4	2.28		14,274.1	18,784.1	3.60	21,000.2	4.03	7,194.3	1.38
	US	11,892.4	1.18		11,215.3	10,114.5	1.00	11,307.8	1.12	13,965.4	1.38
	Total	23,784.8	1.55		25,489.4	28,898.7	1.88	32,307.9	2.11	*21,159.7*	1.38
					7% over base scenario						
2021	Can%	0.5	Growth		0.56	0.65	Growth	0.65	Growth	0.34	Growth
	Can	13,594.2	2.61		16,180.1	20,996.5	4.03	23,212.6	4.45	8,351.5	1.60
	US	13,594.2	1.34		12,713.0	11,305.8	1.12	12,499.1	1.24	16,211.8	1.60
	Total	27,188.5	1.77		28,893.1	32,302.4	2.11	35,711.6	2.33	24,563.3	1.60
						19% over base scenario					
2031	Can%	0.5	Growth		0.56	0.65	Growth	0.65	Growth	0.34	Growth
	Can	14,661.2	2.81		17,375.1	22,383.6	4.29	24,599.6	4.72	9,077.1	1.74
	US	14,661.2	1.45		13,651.9	12,052.7	1.19	13,245.9	1.31	17,620.2	1.74
	Total	29,322.4	1.91		31,027.0	34,436.3	2.25	37,845.5	2.47	26,697.2	1.74
								29% over base scenario			**-14% over base scenario**

NIAGARA CROSSING TRUCK PROJECTIONS

	Predicted	Observed	Exchange	Nom. GDP	Real GDP	Nom. GDP	Real GDP
1985	1434.9	1458.0	0.732	188.4	250.1		
1986	1542.3	1541.0	0.720	207.6	261.1	10.2%	4.4%
1987	1547.4	1476.0	0.754	229.1	271.6	10.4%	4.0%
1988	1544.1	1537.4	0.812	255.2	287.9	11.4%	6.0%
1989	1537.2	1493.4	0.845	277.8	296.5	8.9%	3.0%
1990	1475.1	1432.7	0.857	280.6	291.6	1.0%	-1.7%
1991	1371.0	1419.0	0.873	280.9	282.2	0.1%	-3.2%
1992	1492.6	1519.3	0.827	285.3	285.3	1.6%	1.1%
1993	1621.9	1651.3	0.775	291.8	287.7	2.3%	0.8%
1994	1835.1	1863.4	0.732	307.5	304.0	5.4%	5.7%
1995	1934.4	1930.6	0.729	326.2	316.5	6.1%	4.1%
1996	1962.9	1955.7	0.733	336.3	321.5	3.1%	1.6%
1997	2100.9	2163.7	0.722	355.1	336.9	5.6%	4.8%
1998	2308.5	2266.9	0.674	367.2	351.0	3.4%	4.2%
1999		2433.1	0.673	379.685	2526.000	92.900	3.8%
2000		2459.3	0.673	392.594	2622.500	163.200	6.6%

	Observed	High Scenario	Parity Scenario	Base Scenario	Pass High
1985	1458.0				
1986	1541.0				
1987	1476.0				
1988	1537.4				
1989	1493.4				
1990	1432.7				
1991	1419.0				
1992	1519.3				
1993	1651.3				
1994	1863.4				
1995	1930.6				
1996	1955.7				
1997	2163.7				
1998	2266.9				
1999	2433.1				
2000	2459.3	2459.3	2459.3	2459.3	2459.3
2001		2596.8	2532.8	2581.8	2552.2
2002		2734.3	2606.2	2704.3	2645.2
2003		2871.8	2679.7	2826.8	2738.1
2004		3009.3	2753.1	2949.3	2831.1
2005		3146.8	2826.6	3071.8	2924.0
2006		3284.3	2900.0	3194.3	3016.9
2007		3421.8	2973.5	3316.8	3109.9
2008		3559.3	3046.9	3439.3	3202.8
2009		3696.8	3120.4	3561.8	3295.8
2010		3834.3	3193.8	3684.2	3388.7
2011		3971.8	3267.3	3806.7	3481.6
2012		4147.0	3353.3	3942.8	3567.6
2013		4322.2	3439.3	4078.8	3653.6
2014		4497.5	3525.3	4214.9	3739.6
2015		4672.7	3611.2	4351.0	3825.6
2016		4847.9	3697.2	4487.0	3911.6
2017		5023.2	3783.2	4623.1	3997.6
2018		5198.4	3869.2	4759.1	4083.6
2019		5373.6	3955.2	4895.2	4169.5
2020		5548.8	4041.2	5031.2	4255.5
2021		5724.1	4127.2	5167.3	4341.5
2022		5971.3	4243.3	5306.5	4457.6
2023		6218.4	4359.3	5445.7	4573.7
2024		6465.6	4475.4	5584.9	4689.7
2025		6712.8	4591.5	5724.1	4805.8
2026		6960.0	4707.6	5863.3	4921.9
2027		7207.1	4823.6	6002.5	5038.0
2028		7454.3	4939.7	6141.7	5154.1
2029		7701.5	5055.8	6280.9	5270.1
2030		7948.7	5171.9	6420.1	5386.2
2031		8195.9	5287.9	6559.3	5502.3

NIAGARA CROSSING TRUCK PROJECTIONS

Real GDP and Exchange Rate

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.990695
R Square	0.981477
Adjusted I	0.97811
Standard I	42.43976
Observati	14

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	2	1049818	524908.9	291.4326	2.97E-10
Residual	11	19812.46	1801.133		
Total	13	1069630			

	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	1146.7	242.3	4.7	0.000617	613.3158	1679.997	613.3158	1679.997
Exchange	-2143.4	206.0	-10.4	4.96E-07	-2596.786	-1690.077	-2596.786	-1690.077
Real GDP	7.4	0.5	16.4	4.3E-09	6.43225	8.419517	6.43225	8.419517

RESIDUAL OUTPUT

Observatio	*icted Obse*	*Residuals*	*dard Resid*	*Difference*
1	1434.9	23.1	0.6	2%
2	1542.3	-1.3	0.0	0%
3	1547.4	-71.4	-1.8	-5%
4	1544.1	-6.7	-0.2	0%
5	1537.2	-43.8	-1.1	-3%
6	1475.1	-42.4	-1.1	-3%
7	1371.0	48.0	1.2	3%
8	1492.6	26.7	0.7	2%
9	1621.9	29.4	0.8	2%
10	1835.1	28.3	0.7	2%
11	1934.4	-3.8	-0.1	0%
12	1962.9	-7.2	-0.2	0%
13	2100.9	62.8	1.6	3%
14	2308.5	-41.6	-1.1	-2%
			Average	2.2%

Real GDP

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.893943
R Square	0.799134
Adjusted I	0.782395
Standard I	133.8072
Observati	14

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regressio	1	854777.6	854777.6	47.74126	1.63E-05
Residual	12	214852.6	17904.38		
Total	13	1069630			

	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*pper 95.0%*
Intercept	-1014.629	393.5644	-2.57805	0.024184	-1872.132	-157.1254	-157.1254
Real GDP	9.149159	1.324141	6.909505	1.63E-05	6.264104	12.03421	12.03421

RESIDUAL OUTPUT

Observati	*Predicted*	*Residuals*	*Standard Residuals*	
1	1273.576	184.4239	1.43456	14%
2	1374.217	166.7832	1.297339	12%
3	1470.283	5.716987	0.04447	0%
4	1619.414	-82.01431	-0.637956	-5%
5	1698.097	-204.6971	-1.592257	-12%
6	1653.266	-220.5662	-1.715696	-13%
7	1567.264	-148.2641	-1.153287	-9%
8	1595.626	-76.32649	-0.593713	-5%
9	1617.584	33.71553	0.26226	2%
10	1766.716	96.68423	0.752068	5%
11	1881.08	49.51975	0.385194	3%
12	1926.826	28.87395	0.224599	1%
13	2067.723	95.9769	0.746566	5%
14	2196.726	70.17376	0.545854	3%

Note: compound annual truck growth > GDP rate not sustainable with exchange rate > $0.80

NIAGARA CROSSING TRUCK PROJECTIONS niagtruckscenarios4F.xls

Note: high GDP growth rate makes exchange rate of $1.00 'appear' sustainable

Low Scenario: Real GDP at 2.5% annual growth

2011							
				3374.46			
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	516.5	3835.4	3835.4	3835.4	3835.4	3835.378
			3481.6	3267.3	3052.9	2838.6	3539.5
2000	2459.3	Increase	41.6%	32.9%	24.1%	15.4%	43.9%
		cmpd avg	2.8%	2.2%	1.5%	0.8%	2.9%
		avg ann	3.8%	3.0%	2.2%	1.4%	4.0%
2021							
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	661.1	4909.6	4909.6	4909.6	4909.6	4909.608
			4555.9	4341.5	4127.2	3912.8	4613.7
2000	2459.3	Increase	85.3%	76.5%	67.8%	59.1%	87.6%
		cmpd avg	2.7%	2.4%	2.2%	1.9%	2.8%
		avg ann	4.1%	3.6%	3.2%	2.8%	4.2%
2031							
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	846.3	6284.7	6284.7	6284.7	6284.7	6284.713
			5931.0	5716.6	5502.3	5287.9	5988.8
2000	2459.3	Increase	141.2%	132.4%	123.7%	115.0%	143.5%
		cmpd avg	2.7%	2.5%	2.4%	2.2%	2.7%
		avg ann	4.6%	4.3%	4.0%	3.7%	4.6%

High Scenario: Real GDP at 3.5% annual growth

2011							
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	574.7	4267.7	4267.7	4267.7	4267.7	4267.657
			3913.9	3699.6	3485.2	3270.9	3971.8
2000	2459.3	Increase	59.1%	50.4%	41.7%	33.0%	61.5%
		cmpd avg	3.8%	3.3%	2.7%	2.1%	4.0%
		avg ann	5.4%	4.6%	3.8%	3.0%	5.6%
2021							
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	810.7	6020.0	6020.0	6020.0	6020.0	6019.951
			5666.2	5451.9	5237.5	5023.2	5724.1
2000	2459.3	Increase	130.4%	121.7%	113.0%	104.3%	132.8%
		cmpd avg	3.7%	3.5%	3.3%	3.1%	3.8%
		avg ann	6.2%	5.8%	5.4%	5.0%	6.3%
2031							
Variable	Coeficient	GDP	$ 0.70	$ 0.80	$ 0.90	$ 1.00	$ 0.67
Intercept	1146.66		1146.7	1146.7	1146.7	1146.7	1146.7
Exchange	-2143.43		-1500.4	-1714.7	-1929.1	-2143.4	-1442.529
Real GDP	7.43	1143.5	8491.7	8491.7	8491.7	8491.7	8491.736
			8138.0	7923.6	7709.3	7495.0	8195.9
2000	2459.3	Increase	230.9%	222.2%	213.5%	204.8%	233.3%
		cmpd avg	3.7%	3.6%	3.5%	3.4%	3.7%
		avg ann	7.4%	7.2%	6.9%	6.6%	7.5%

Real GDP at 3.0%; Exch $0.75

2011			
Variable	Coeficient	GDP	$ 0.75
Intercept	1146.66		1146.7
Exchange	-2143.43		-1607.6
Real GDP	7.43	544.9	4046.3
			3585.4
2000	2459.3	Increase	45.8%
		cmpd avg	3.0%
		avg ann	4.2%
2021			
Variable	Coeficient	GDP	$ 0.75
Intercept	1146.66		1146.7
Exchange	-2143.43		-1607.6
Real GDP	7.43	732.3	5437.9
			4976.9
2000	2459.3	Increase	102.4%
		cmpd avg	3.1%
		avg ann	4.9%
2031			
Variable	Coeficient	GDP	$ 0.75
Intercept	1146.66		1146.7
Exchange	-2143.43		-1607.6
Real GDP	7.43	984.1	7308.0
			6847.1
2000	2459.3	Increase	178.4%
		cmpd avg	3.1%
		avg ann	5.8%

Variable Real GDP; Exch $0.75

2011			
Variable	Coeficient	GDP	$ 0.75
Intercept	1146.66		1146.7
Exchange	-2143.43	**@3.5%**	-1607.6
Real GDP	7.43	574.7	4267.7
			3806.7
2000	2459.3	Increase	54.8%
		cmpd avg	3.5%
		avg ann	5.0%
2021			
Variable	Coeficient	GDP	$ 0.80
Intercept	1146.66		1146.7
Exchange	-2143.43	**@3.0%**	-1714.7
Real GDP	7.43	772.3	5735.4
	0.75	4938.8	5167.3
2000	2459.3	Increase	110.1%
		cmpd avg	3.4%
		avg ann	5.2%
2031			
Variable	Coeficient	GDP	$ 0.90
Intercept	1146.66		1146.7
Exchange	-2143.43	**@2.5%**	-1929.1
Real GDP	7.43	988.7	7341.8
	0.75	6395.1	6559.3
2000	2459.3	Increase	166.7%
		cmpd avg	3.1%
		avg ann	5.4%

42-80130 (Niagara Region)
Summary of Traffic Information from 1990 - 2000 at Fort Erie, Niagara Falls (Queenston, Rainbow and Whirlpool Bridge)

ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES
(FORT ERIE, ONT)
(NIAGARA FALLS-QUEENSTON, ONT)
(NIAGARA FALLS-RAINBOW, ONT)
(NIAGARA FALLS-WHIRLPOOL, ONT)

Year	Total	Total Auto	US veh	US auto	CAN veh	CAN auto
1990	10,192,455	9,459,924	4,329,003	4,036,021	5,863,452	5,423,903
1991	10,430,426	9,703,530	4,276,888	3,962,358	6,153,538	5,741,172
1992	10,057,159	9,285,214	4,090,578	3,749,883	5,966,581	5,535,331
1993	9,182,470	8,342,988	4,096,616	3,737,236	5,085,854	4,605,752
1994	8,423,109	7,471,825	4,170,440	3,789,466	4,252,669	3,682,359
1995	8,329,822	7,330,614	4,343,292	3,962,854	3,986,530	3,367,760
1996	8,305,698	7,272,638	4,252,035	3,883,855	4,053,663	3,388,783
1997	8,818,543	7,710,184	4,873,211	4,501,649	3,945,332	3,208,535
1998	8,488,760	7,321,678	5,169,400	4,800,994	3,319,360	2,520,684
1999	8,433,739	7,194,237	5,079,813	4,720,578	3,353,926	2,473,659
2000	8,423,089	7,158,698	5,037,525	4,701,741	3,385,563	2,456,957

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1990	42	40	58	53	43	57
1991	41	38	59	55	41	59
1992	41	37	59	55	40	60
1993	45	41	55	50	45	55
1994	50	45	50	44	51	49
1995	52	48	48	40	54	46
1996	51	47	49	41	53	47
1997	55	51	45	36	58	42
1998	61	57	39	30	66	34
1999	60	56	40	29	66	34
2000	60	56	40	29	66	34

ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES
(FORT ERIE, ONT)

Year	Total	Total Auto	US veh	US auto	CAN veh	CAN auto
1990	4030629	3658155	2288340	2144501	1742289	1513654
1991	4035159	3641281	2264227	2106287	1770932	1534994
1992	4058179	3618256	2233352	2054742	1824827	1563514
1993	3925905	3429937	2208784	2017658	1717121	1412279
1994	3794446	3248147	2211191	2018492	1583255	1229655
1995	3843243	3260303	2321102	2123852	1522141	1136451
1996	3793109	3189968	2251455	2066627	1541654	1123341
1997	3837096	3165110	2260540	2063573	1576556	1101537
1998	3805178	3094347	2327635	2127819	1477543	966528
1999	3988608	3233999	2398803	2212405	1589805	1021594
2000	4098577	3369359	2493036	2338800	1605540	1030559

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1990	57	53	43	38	59	41
1991	56	52	44	38	58	42
1992	55	51	45	39	57	43
1993	56	51	44	36	59	41
1994	58	53	42	32	62	38
1995	60	55	40	30	65	35
1996	59	54	41	30	65	35
1997	59	54	41	29	65	35
1998	61	56	39	25	69	31
1999	60	55	40	26	68	32
2000	61	57	39	25	69	31

ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES
(NIAGARA FALLS-QUEENSTON, ONT)

Year	Total	Total Auto	US veh	US auto	CAN veh	CAN auto
1990	2773565	2450113	911018	784817	1862547	1665296
1991	2765898	2454932	955606	811392	1810292	1643540
1992	2584562	2269677	836474	683252	1748088	1586425
1993	2348419	2017599	863624	701957	1484795	1315642
1994	2150153	1765151	917990	739430	1232163	1025721
1995	2194110	1788832	977489	799979	1216621	988853
1996	2281367	1860390	938584	759388	1342783	1101002
1997	2306039	1877403	1008294	837441	1297745	1039962
1998	2212825	1759259	1099531	932517	1113294	826742
1999	2175937	1692384	1055720	883757	1120217	808627
2000	2267135	1732989	1063567	882703	1203568	850286

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1990	33	28	67	60	32	68
1991	35	29	65	59	33	67
1992	32	26	68	61	30	70
1993	37	30	63	56	35	65
1994	43	34	57	48	42	58
1995	45	36	55	45	45	55
1996	41	33	59	48	41	59
1997	44	36	56	45	45	55
1998	50	42	50	37	53	47
1999	49	41	51	37	52	48
2000	47	39	53	38	51	49

ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES
(NIAGARA FALLS-RAINBOW, ONT)

Year	Total	Total Auto	US veh	US auto	CAN veh	CAN auto
1990	2155531	2149994	846342	843258	1309189	1306736
1991	2466754	2462337	846564	844747	1620190	1617590
1992	2248710	2245536	798956	797621	1449754	1447915
1993	2065161	2062548	780465	779324	1284696	1283224
1994	1703769	1699697	769373	767309	934396	932388
1995	1599334	1598120	791603	790781	807731	807339
1996	1597396	1596579	830179	829790	767217	766789
1997	1997102	1996239	1305575	1305062	691527	691177
1998	2096537	2095312	1543720	1542824	552817	552488
1999	2052196	2050856	1496928	1496054	555268	554802
2000	1841820	1840793	1350992	1350308	490829	490485

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1990	39	39	61	61	39	61
1991	34	34	66	66	34	66
1992	36	35	64	64	36	64
1993	38	38	62	62	38	62
1994	45	45	55	55	45	55
1995	49	49	51	50	49	51
1996	52	52	48	48	52	48
1997	65	65	35	35	65	35
1998	74	74	26	26	74	26
1999	73	73	27	27	73	27
2000	73	73	27	27	73	27

ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES (NIAGARA FALLS-WHIRLPOOL, ONT)

Year	Total	Total Auto	US veh	US auto	CAN veh	CAN auto
1990	1232730	1201662	283303	263445	949427	938217
1991	1162615	1144980	210491	199932	952124	945048
1992	1165708	1151745	221796	214268	943912	937477
1993	842985	832904	243743	238297	599242	594607
1994	774741	758830	271886	264235	502855	494595
1995	693135	683359	253098	248242	440037	435117
1996	633826	625701	231817	228050	402009	397651
1997	678306	671432	298802	295573	379504	375859
1998	374220	372760	198514	197834	175706	174926
1999	216998	216998	128362	128362	88636	88636
2000	215557	215557	129930	129930	85626	85626

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1990	23	21	77	76	22	78
1991	18	17	82	81	17	83
1992	19	18	81	80	19	81
1993	29	28	71	71	29	71
1994	35	34	65	64	35	65
1995	37	36	63	63	36	64
1996	37	36	63	63	36	64
1997	44	44	56	55	44	56
1998	53	53	47	47	53	47
1999	59	59	41	41	59	41
2000	60	60	40	40	60	40

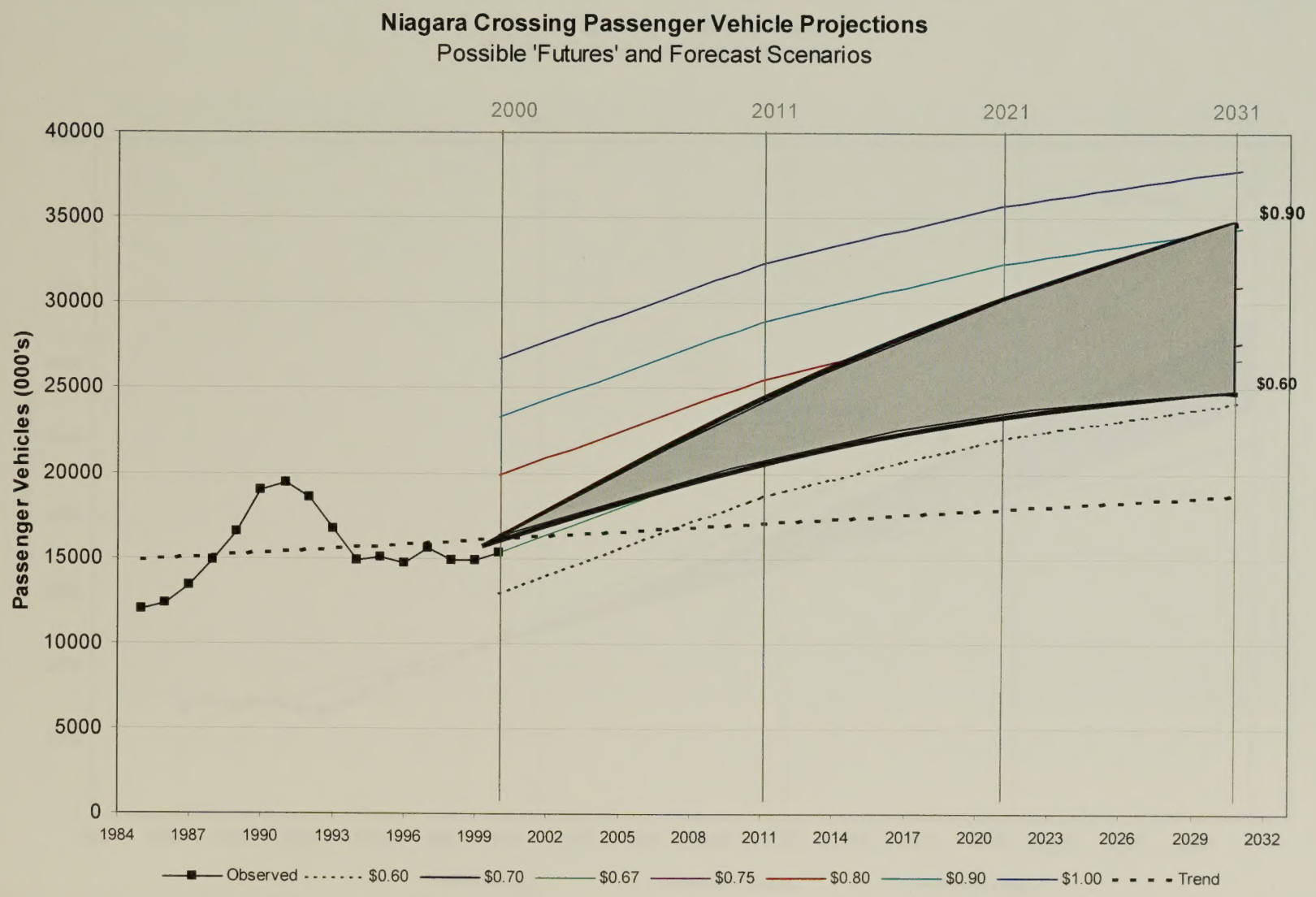
ANNUAL TRAFFIC VOLUME BETWEEN CANADA AND THE UNITED STATES

IN ONTARIO (from 1972)

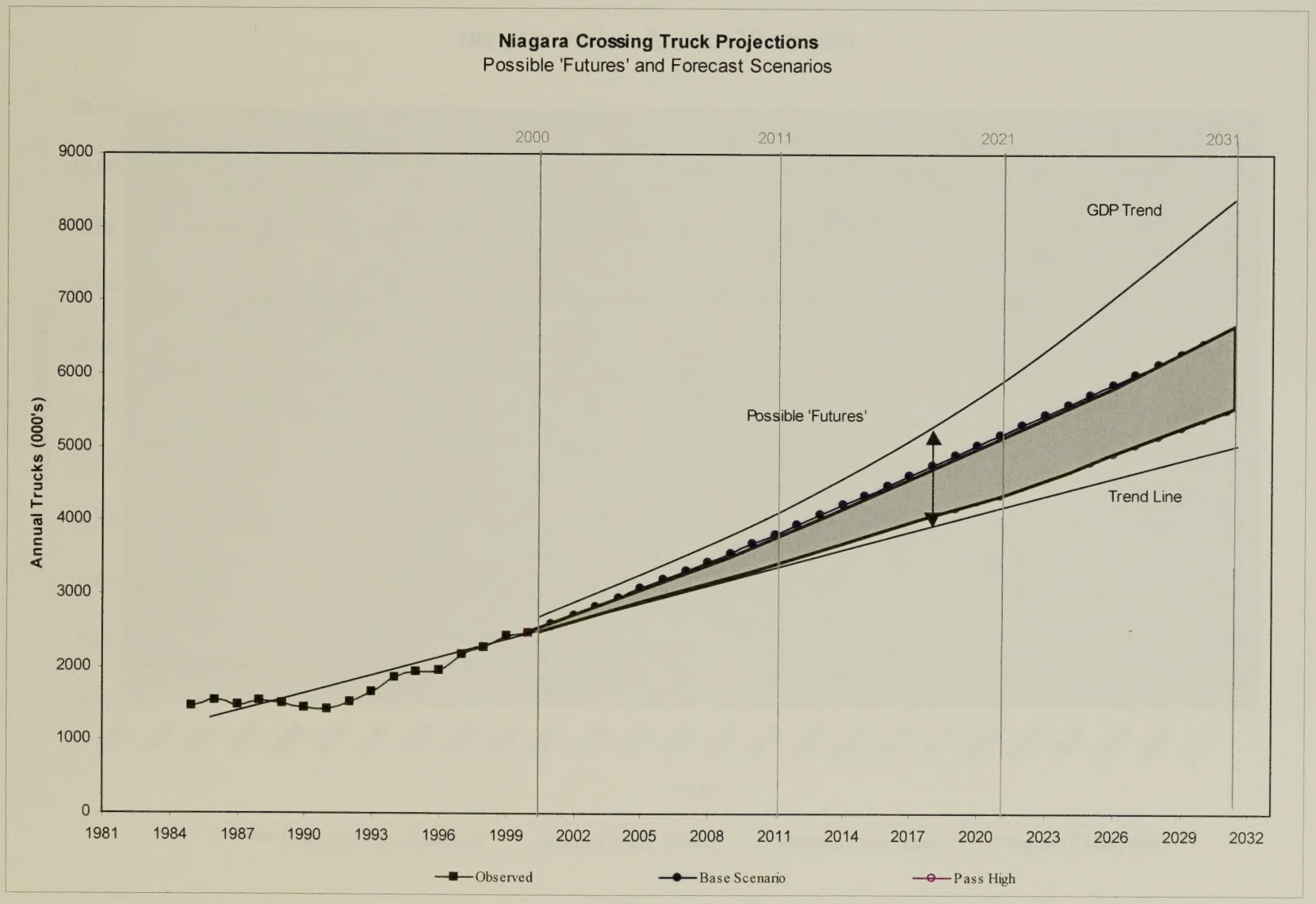
Year	Total	Total auto	US veh	US auto	CAN veh	CAN auto
1972	13,906,273	12,764,185	8,252,342	7,767,871	5,653,931	4,996,314
1973	14,182,072	12,951,197	8,505,126	7,955,690	5,676,946	4,995,507
1974	13,880,016	12,675,613	8,330,615	7,794,283	5,549,401	4,881,330
1975	14,107,299	12,975,561	8,289,361	7,752,612	5,817,938	5,222,949
1976	14,233,727	12,923,911	7,916,460	7,292,539	6,317,267	5,631,372
1977	14,527,241	13,171,041	7,937,929	7,297,058	6,589,312	5,873,983
1978	14,656,319	13,272,459	7,899,268	7,290,539	6,757,051	5,981,920
1979	14,729,251	13,301,562	8,261,059	7,608,151	6,468,192	5,693,411
1980	18,302,485	17,014,247	11,750,779	11,171,786	6,551,706	5,842,461
1981	19,097,174	17,697,552	12,530,496	11,903,987	6,566,678	5,793,565
1982	15,632,787	14,235,418	9,107,087	8,489,318	6,525,700	5,746,100
1983	16,416,638	14,783,567	9,153,967	8,419,187	7,262,671	6,364,380
1984	16,671,391	14,782,420	9,320,925	8,500,490	7,350,466	6,281,930
1985	17,096,040	15,058,301	9,709,459	8,815,862	7,386,581	6,242,439
1986	17,897,159	15,740,035	10,230,620	9,317,173	7,666,539	6,422,862
1987	18,950,893	16,717,318	10,523,532	9,575,294	8,427,361	7,142,024
1988	20,344,165	17,994,207	10,387,607	9,400,055	9,956,558	8,594,152
1989	21,912,417	19,541,094	10,072,872	9,067,189	11,839,545	10,473,905
1990	24,396,559	22,156,126	10,131,875	9,151,428	14,264,684	13,004,698
1991	26,148,222	23,933,182	9,998,625	8,976,909	16,149,597	14,956,273
1992	26,177,508	23,771,868	9,920,440	8,803,674	16,257,068	14,968,194
1993	24,852,755	22,137,301	10,118,608	8,903,682	14,734,147	13,233,619
1994	23,823,252	20,775,185	11,166,752	9,833,871	12,656,500	10,941,314
1995	24,580,381	21,339,901	12,493,671	11,137,805	12,086,710	10,202,096
1996	25,159,248	21,750,920	12,688,142	11,295,247	12,471,106	10,455,673
1997	25,922,778	22,283,170	13,543,462	12,095,857	12,379,316	10,187,313
1998	26,010,843	22,132,731	14,631,143	13,148,328	11,379,700	8,984,403
1999	26,486,210	22,205,890	14,744,034	13,129,234	11,742,176	9,076,656
2000	26,337,335	21,939,300	14,276,014	12,665,079	12,061,697	9,274,221

Year	Percent					
	US veh/Total	US auto/Total	CAN veh/Total	CAN auto/Total	US Auto/Total Auto	CAN Auto/Total Auto
1972	59	56	41	36	61	39
1973	60	56	40	35	61	39
1974	60	56	40	35	61	39
1975	59	55	41	37	60	40
1976	56	51	44	40	56	44
1977	55	50	45	40	55	45
1978	54	50	46	41	55	45
1979	56	52	44	39	57	43
1980	64	61	36	32	66	34
1981	66	62	34	30	67	33
1982	58	54	42	37	60	40
1983	56	51	44	39	57	43
1984	56	51	44	38	58	42
1985	57	52	43	37	59	41
1986	57	52	43	36	59	41
1987	56	51	44	38	57	43
1988	51	46	49	42	52	48
1989	46	41	54	48	46	54
1990	42	38	58	53	41	59
1991	38	34	62	57	38	62
1992	38	34	62	57	37	63
1993	41	36	59	53	40	60
1994	47	41	53	46	47	53
1995	51	45	49	42	52	48
1996	50	45	50	42	52	48
1997	52	47	48	39	54	46
1998	56	51	44	35	59	41
1999	56	50	44	34	59	41
2000	54	48	46	35	58	42

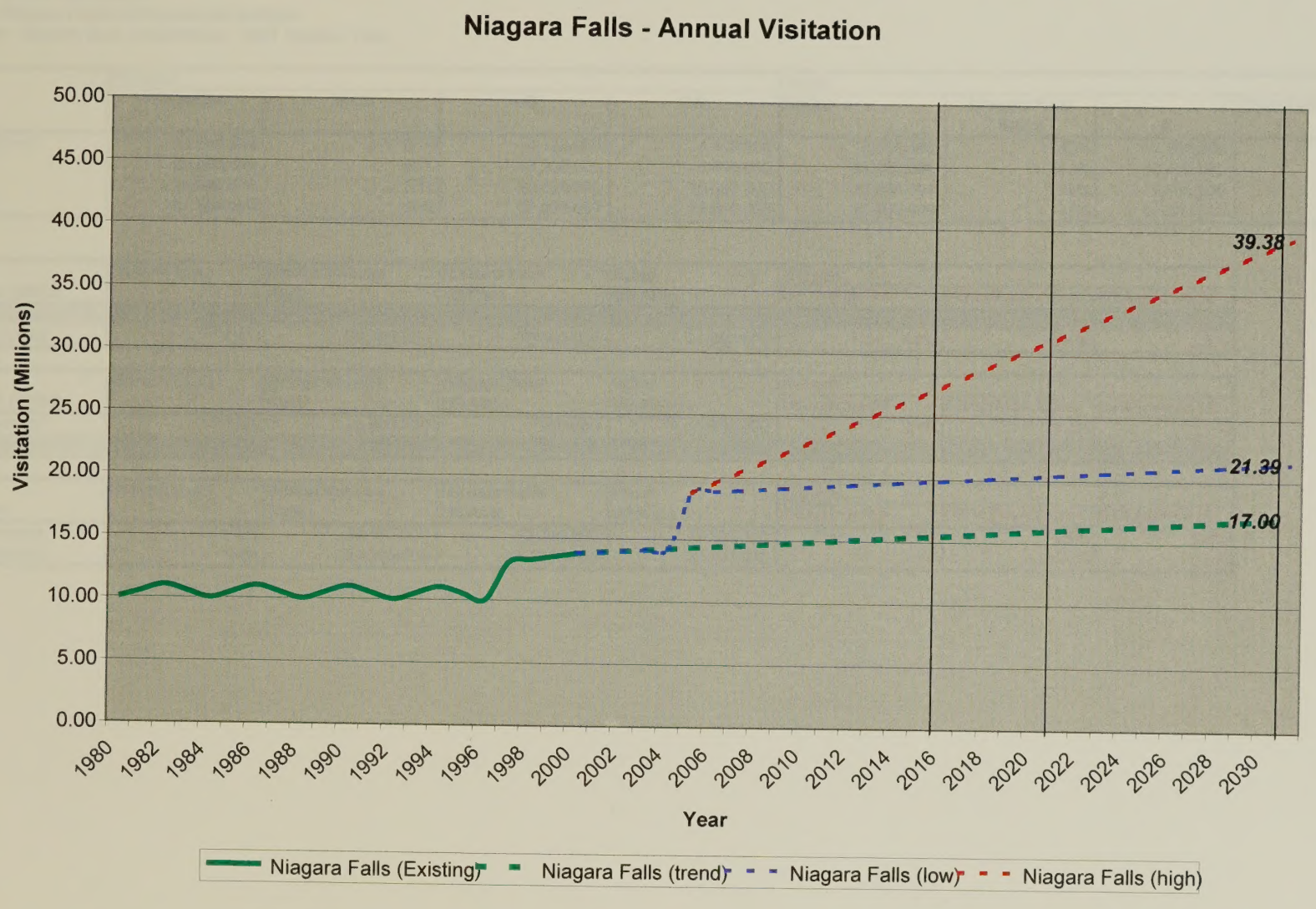
APPENDIX H
FUTURE BRIDGE GROWTH



Niagara Bridge Crossing Growth - Passenger Vehicles



Niagara Bridge Crossing Growth - Commercial Vehicles



Niagara Visitation Forecasts

MTO Niagara Needs Assessment
Niagara Falls/Niagara Region/International Bridges
Tourist Market - Growth Rate Calculations - 2021 Horizon Year

Scenario	Persons				Autos			
	Visitation	% US	US	Cdn	Bridge	Niagara Falls Share	#	Other (incl. GTA)
Existing Conditions	**13,800,000**	66%	9,100,000	*4,700,000*	**16,000,000**	45%	7,200,000	8,800,000
Low Visitation	**20,000,000**	66%	13,200,000	*6,800,000*	**23,200,000**	45%	10,400,000	12,800,000
Low Visitation	**20,000,000**	50%	10,000,000	*10,000,000*	**17,600,000**	45%	7,900,000	9,700,000
High Visitation	**31,000,000**	50%	15,500,000	*15,500,000*	**27,200,000**	45%	12,200,000	15,000,000

Low Visitation (66/34)	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast	***1.9%***	***23,800,000***	***10,400,000***	***13,400,000***	***1.8%***	***2.0%***	***1.8%***
High Bridge Forecast	3.4%	32,300,000	10,400,000	21,900,000	***1.8%***	***4.4%***	***1.8%***

Low Visitation (50/50)	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast	1.9%	23,800,000	7,900,000	15,900,000	0.4%	2.9%	3.7%
High Bridge Forecast	***3.4%***	***32,300,000***	***7,900,000***	***24,400,000***	***0.4%***	***5.0%***	***3.7%***

High Visitation	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast	1.9%	23,800,000	12,200,000	11,600,000	2.5%	1.3%	5.8%
High Bridge Forecast	3.4%	32,300,000	12,200,000	20,100,000	2.5%	4.0%	5.8%

MTO Niagara Needs Assessment
Niagara Falls/Niagara Region/International Bridges
Tourist Market - Growth Rate Calculations - 2031 Horizon Year

Scenario	Persons				Autos			
	Visitation	% US	US	Cdn	Bridge	Niagara Falls Share	#	Other (incl. GTA)
Existing Conditions	**13,800,000**	66%	9,100,000	4,700,000	**16,000,000**	45%	7,200,000	8,800,000
Low Visitation	**22,000,000**	66%	14,500,000	7,500,000	**25,500,000**	45%	11,500,000	14,000,000
Low Visitation	**22,000,000**	50%	11,000,000	11,000,000	**19,300,000**	45%	8,700,000	10,600,000
High Visitation	**40,000,000**	50%	20,000,000	20,000,000	**35,200,000**	45%	15,800,000	19,400,000

Low Visitation (66/34)	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast*	***1.6%***	***26,200,000***	***11,500,000***	***14,700,000***	***1.5%***	***1.7%***	***1.5%***
High Bridge Forecast*	2.7%	36,500,000	11,500,000	25,000,000	***1.5%***	***3.4%***	***1.5%***

Low Visitation (50/50)	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast	1.6%	26,200,000	8,700,000	17,500,000	0.6%	2.2%	2.8%
High Bridge Forecast	***2.7%***	***36,500,000***	***8,700,000***	***27,800,000***	***0.6%***	***3.8%***	***2.8%***

High Visitation	Growth (p.a.)	Bridge Volume Auto	Niagara Falls US Auto	Other US Auto	Growth		
					US to/from NF	US to/from Other	GTA to/from NF
Low Bridge Forecast	1.6%	26,200,000	15,800,000	10,400,000	2.6%	0.5%	4.8%
High Bridge Forecast	2.7%	36,500,000	15,800,000	20,700,000	2.6%	2.8%	4.8%

Niagara Needs Assessment
Base Tourist/Bridge Crossing Trip Matrices

Year 2000 revised

	GTA	Niagara	Niagara Falls	Bridges	Total
GTA	1,889	-	510	407	2,806
Niagara	-	-	-	626	626
Niagara Falls	470	-	-	696	1,166
Bridges	509	724	819	-	2,051
Total	2,868	724	1,329	1,729	6,649

Year 2021 Low

	GTA	Niagara	Niagara Falls	Bridges	Total	
GTA	2,796	-	742	617	4,154	
Niagara	-	-	-	948	948	
Niagara Falls	683	-	-	1,012	1,696	1.8%
Bridges	771	1,097	1,190	-	3,059	***1.9%***
Total	4,250	1,097	1,932	2,578	9,857	
			1.8%	***1.9%***		**1.9%**

Year 2021 High

	GTA	Niagara	Niagara Falls	Bridges	Total	
GTA	2,796	-	1,094	1,134	5,023	
Niagara	-	-	-	1,743	1,743	
Niagara Falls	1,008	-	-	757	1,765	3.7%
Bridges	1,417	2,017	890	-	4,323	***3.6%***
Total	5,221	2,017	1,984	3,633	12,855	
			3.7%	***3.6%***		**3.2%**

Year 2031 Low

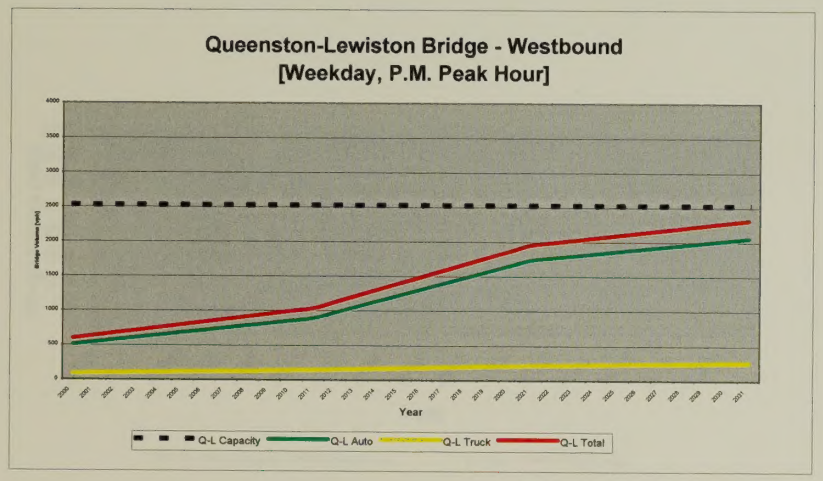
	GTA	Niagara	Niagara Falls	Bridges	Total	
GTA	2,796	-	809	686	4,291	
Niagara	-	-	-	1,055	1,055	
Niagara Falls	746	-	-	1,105	1,851	1.5%
Bridges	857	1,220	1,299	-	3,377	***1.6%***
Total	4,399	1,220	2,109	2,846	10,574	
			1.5%	***1.6%***		**1.5%**

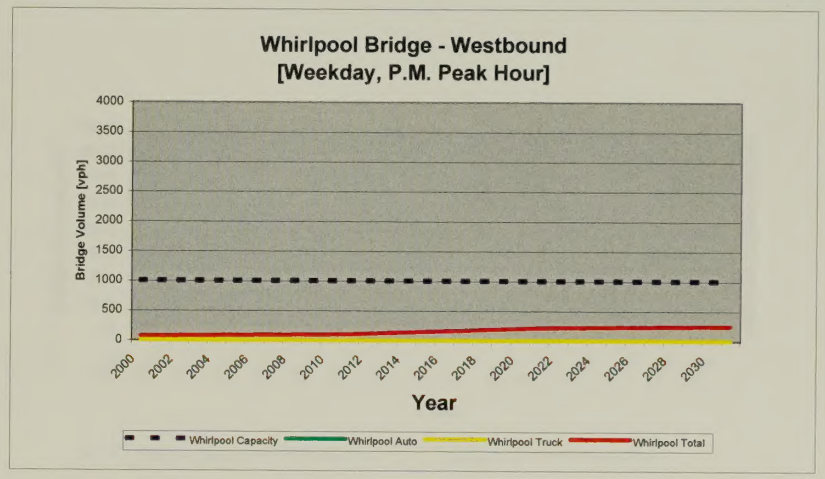
Year 2031 High

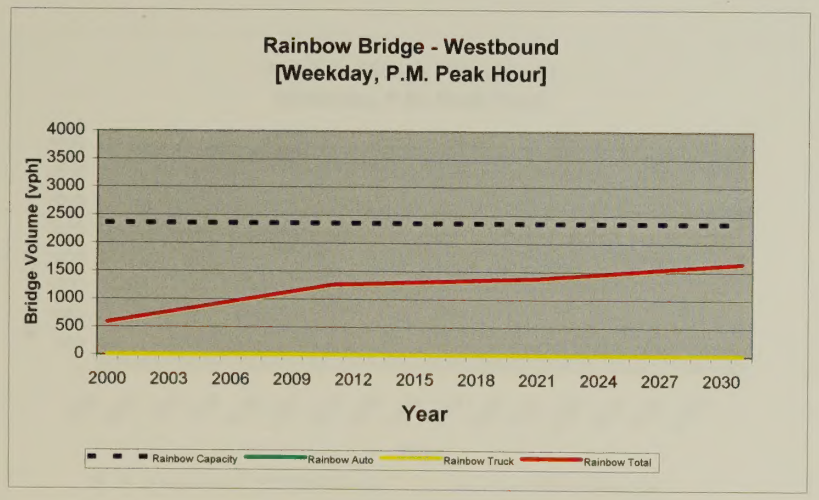
	GTA	Niagara	Niagara Falls	Bridges	Total	
GTA	2,796	-	1,201	1,293	5,289	
Niagara	-	-	-	1,987	1,987	
Niagara Falls	1,106	-	-	838	1,945	2.8%
Bridges	1,616	2,300	986	-	4,901	***2.8%***
Total	5,518	2,300	2,186	4,119	14,122	
			2.8%	***2.8%***		**2.5%**

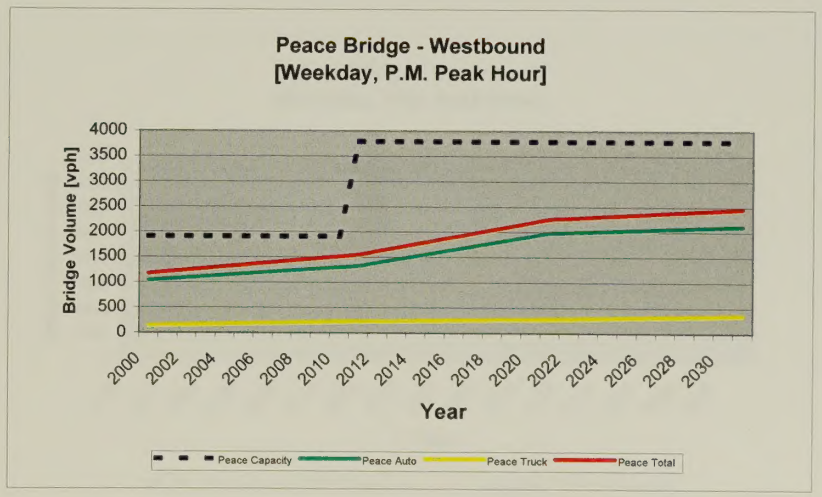
APPENDIX H
INTERNATIONAL BRIDGE – LEVEL OF SERVICE

International Bridge Crossings
Level of Service

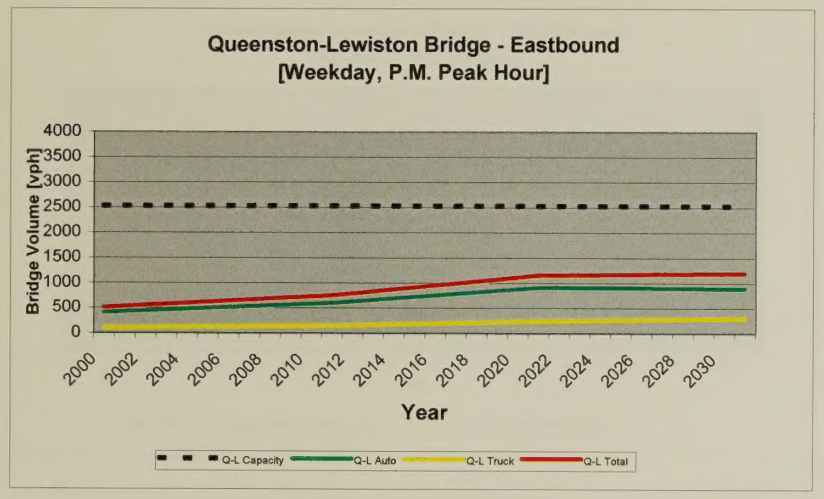


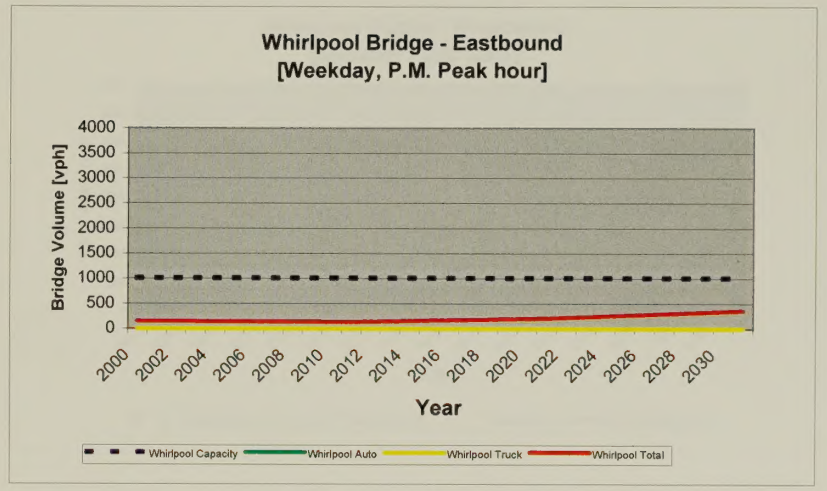


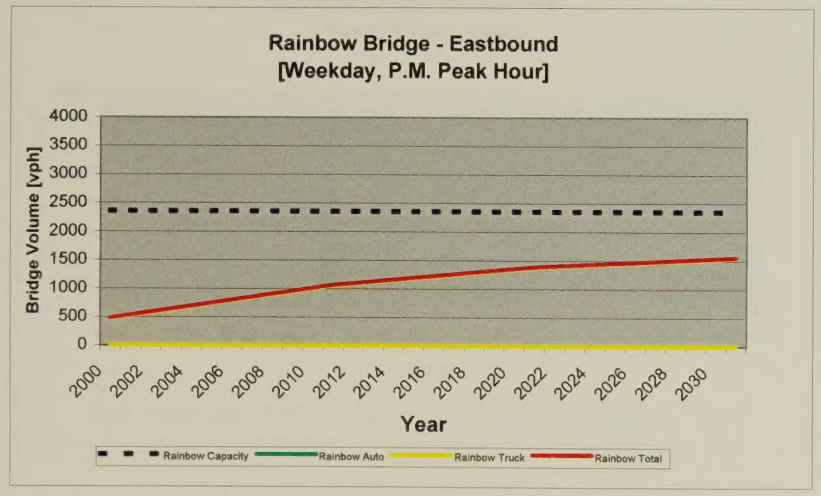


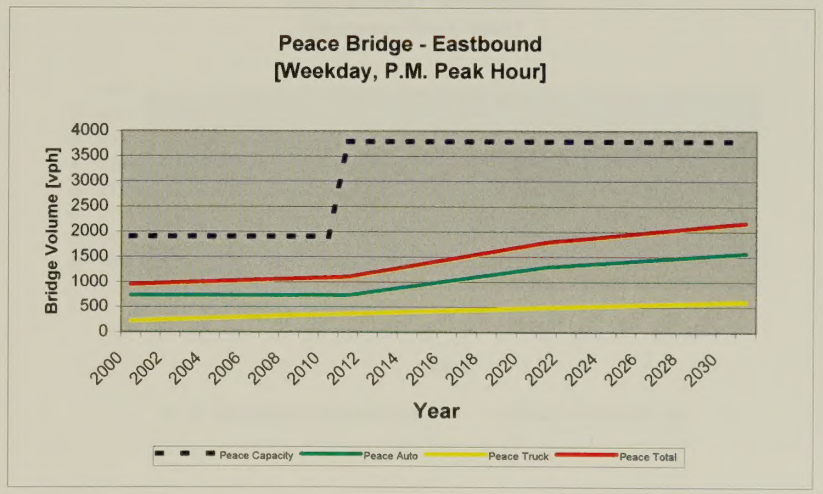


International Bridge Crossings
Level of Service

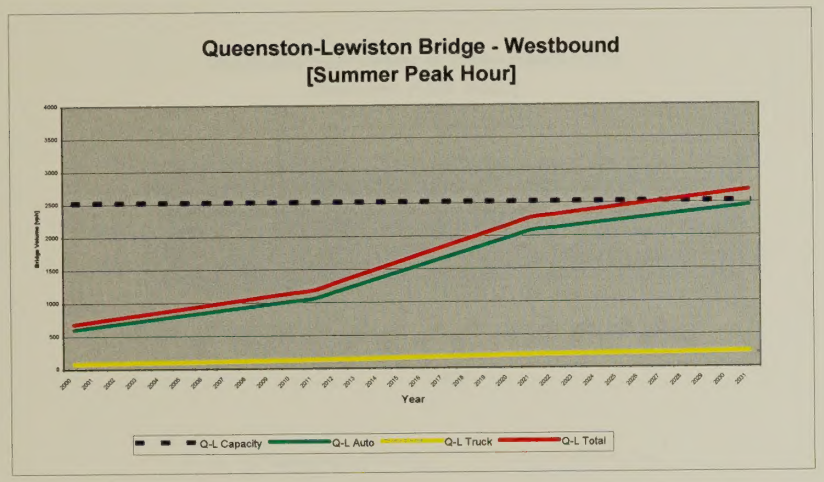


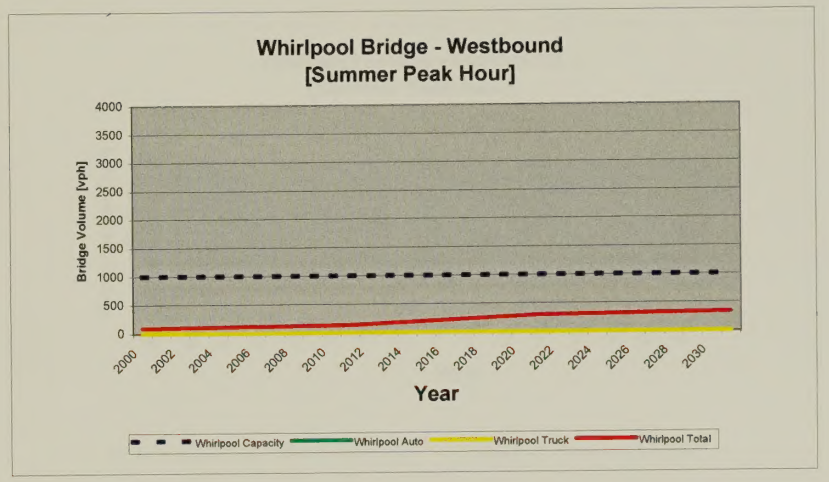


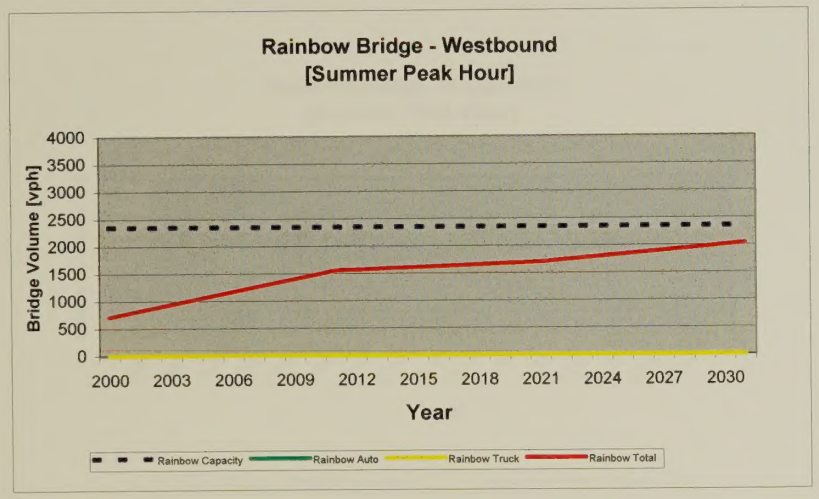


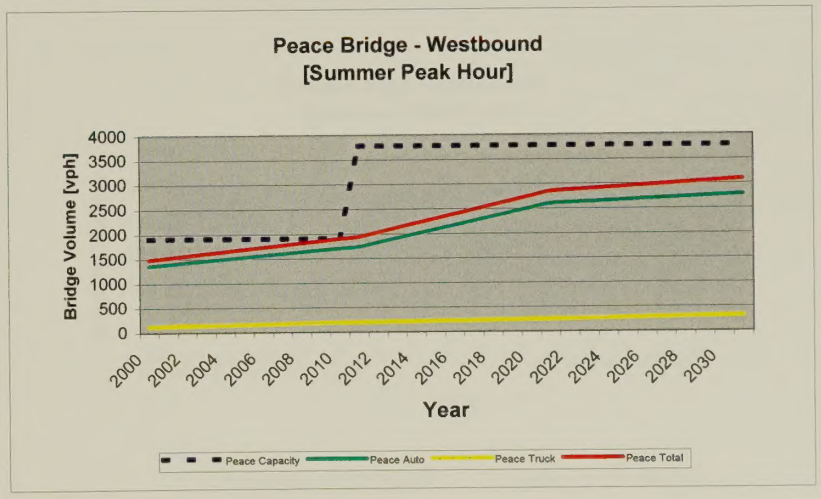


International Bridge Crossings
Level of Service

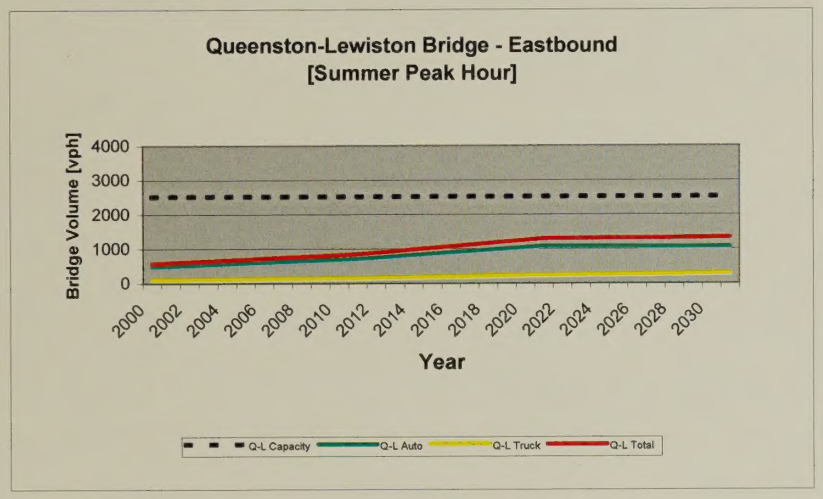


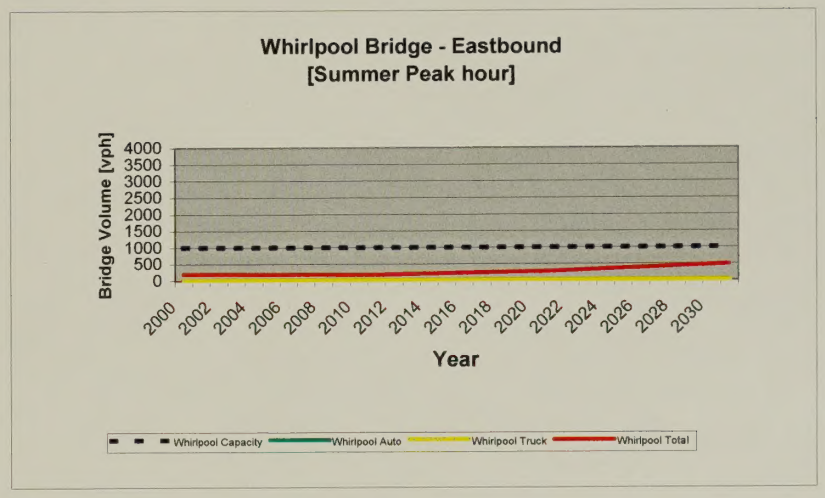


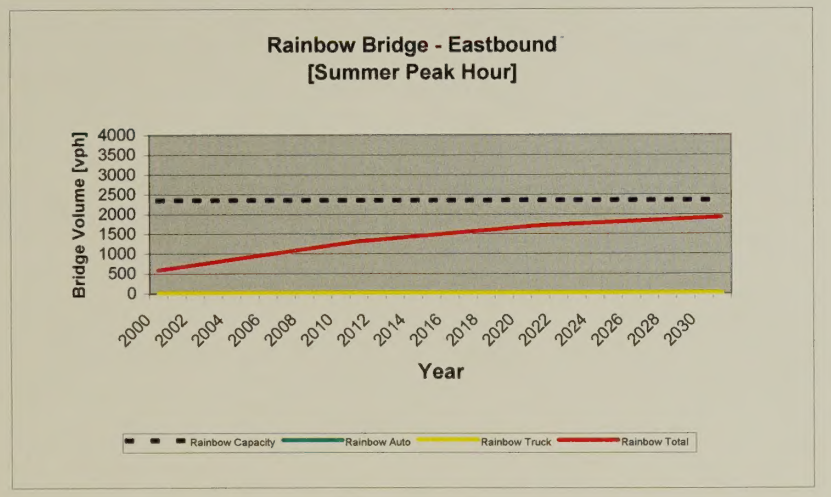


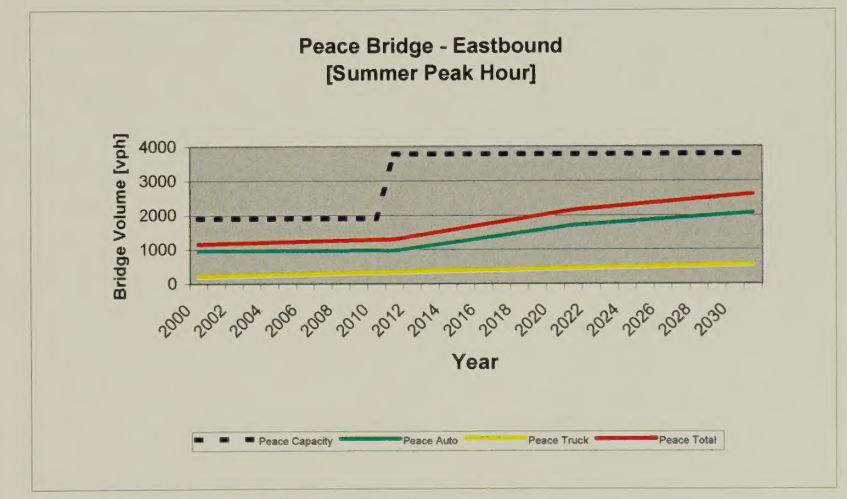


International Bridge Crossings
Level of Service









APPENDIX I

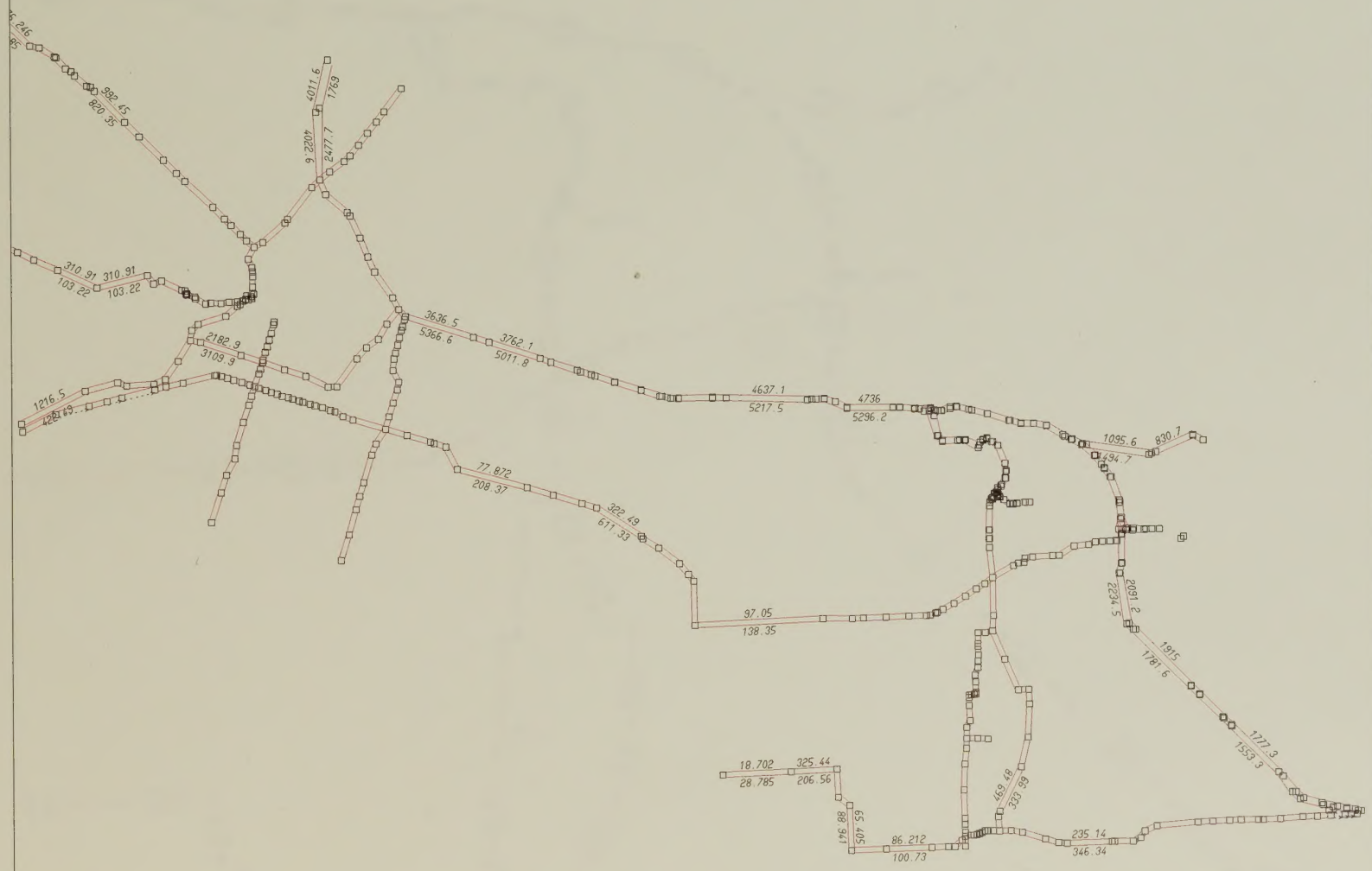
Base Network - Volumes

APPENDIX I
2011 BASE NETWORK – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1111: Year 2011 pmpkhr LOW - Base Network

02-07-08 13:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1111: Year 2011 pmpkhr LOW - Base Network

02-07-08 13:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1111: Year 2011 pmpkhr LOW - Base Network

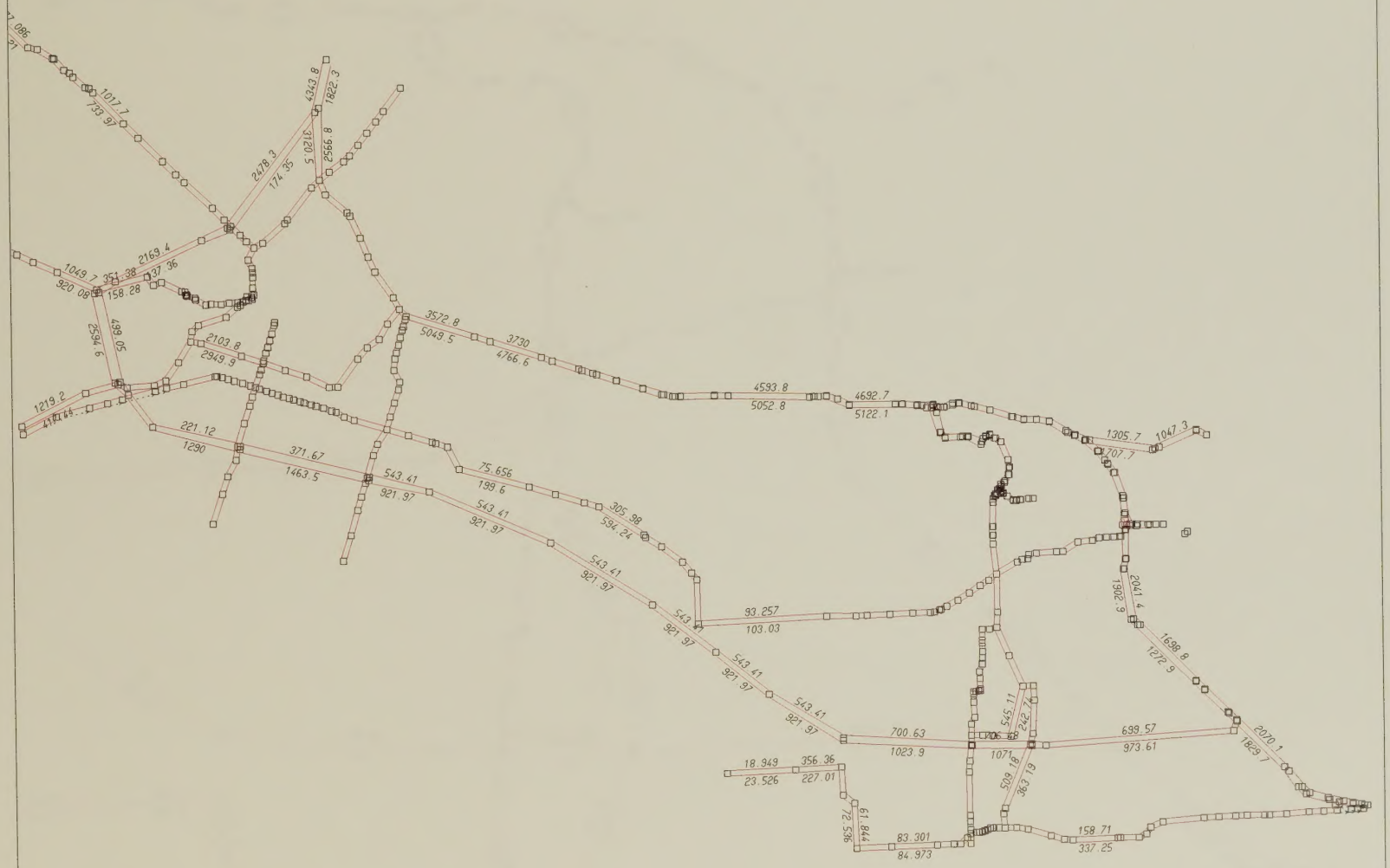
02-07-08 13:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600



WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1182: Year 2011 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 13:44
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1182: Year 2011 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 13:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 1182: Year 2011 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 13:45
MODULE: 2.13
TSH.....dd

APPENDIX I
2021 BASE NETWORK – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2111: Year 2021 pmpkhr LOW - Base Network

02-07-08 13:46
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2111: Year 2021 pmpkhr LOW - Base Network

02-07-08 13:54
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2111: Year 2021 pmpkhr LOW - Base Network

02-07-08 13:54
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2181: Year 2021 pmpkhr LOW-Revised Base Network w\MPC Alt.C

02-07-08 13:55
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2181: Year 2021 pmpkhr LOW-Revised Base Network w\MPC Alt.C

02-07-08 13:55
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2181: Year 2021 pmpkhr LOW-Revised Base Network w\MPC Alt.C

02-07-08 13:55
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2112: Year 2021 pmpkhr HIGH - Base Network

02-07-08 13:56
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

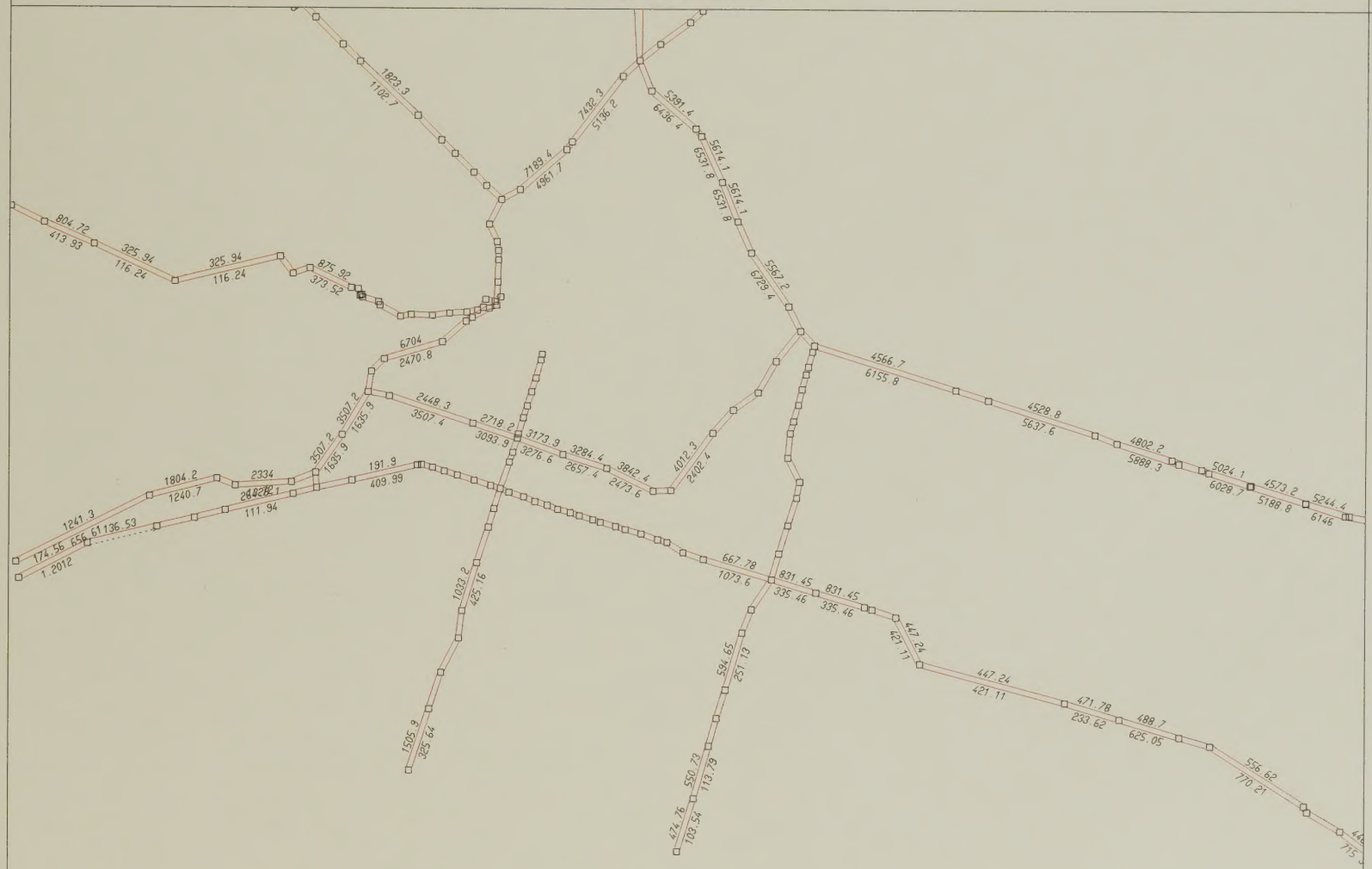
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2112: Year 2021 pmpkhr HIGH - Base Network

02-07-08 13:56
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2112: Year 2021 pmpkhr HIGH - Base Network

02-07-08 13:57
MODULE: 2.13
TSH.....dd

APPENDIX I
2031 BASE NETWORK – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3111: Year 2031 pmpkhr LOW - Base Network

02-07-08 14:02
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3111: Year 2031 pmpkhr LOW - Base Network

02-07-08 14:02
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3111: Year 2031 pmpkhr LOW - Base Network

02-07-08 14:02
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

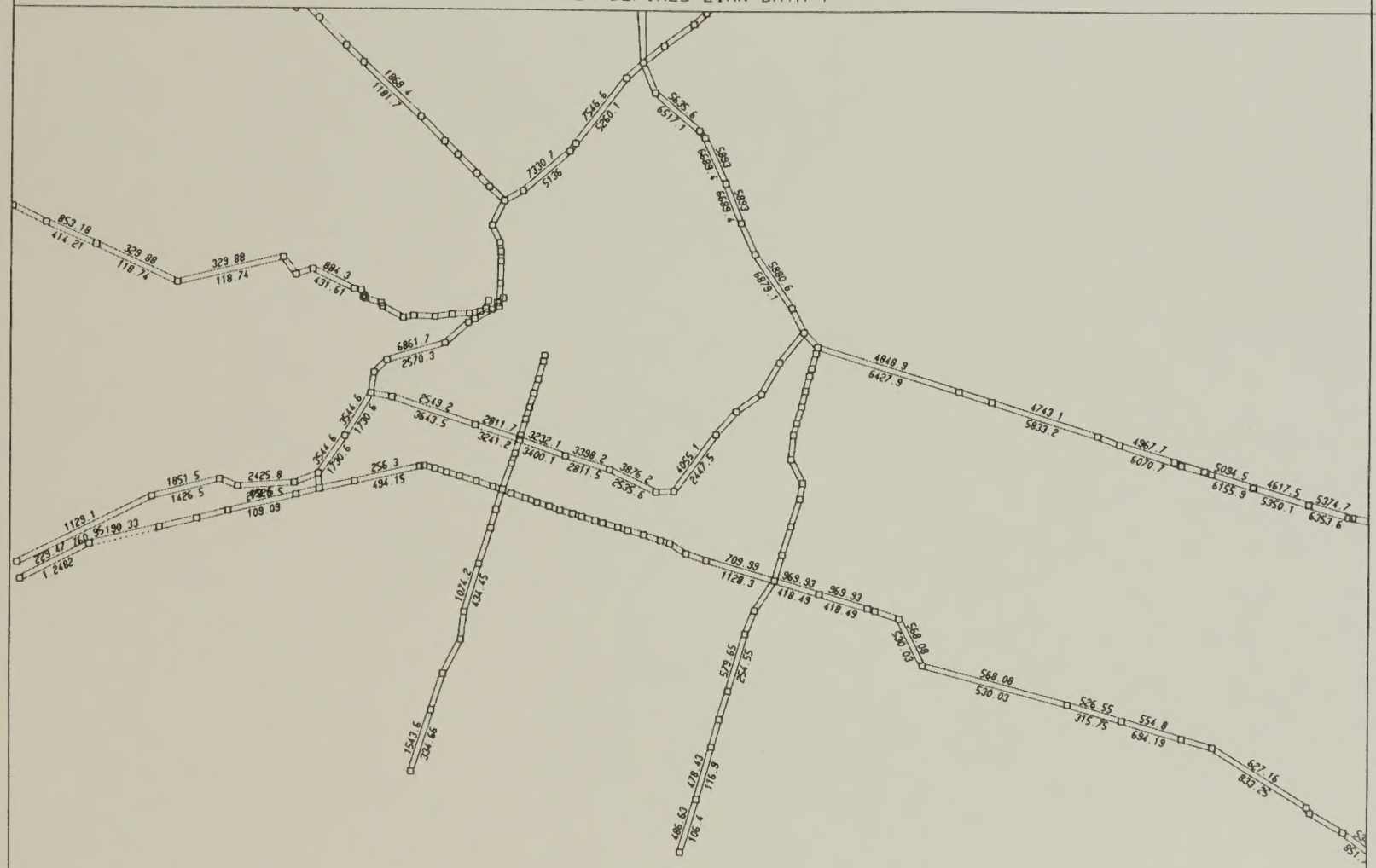
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3112: Year 2031 pmpkhr HIGH - Base Network

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

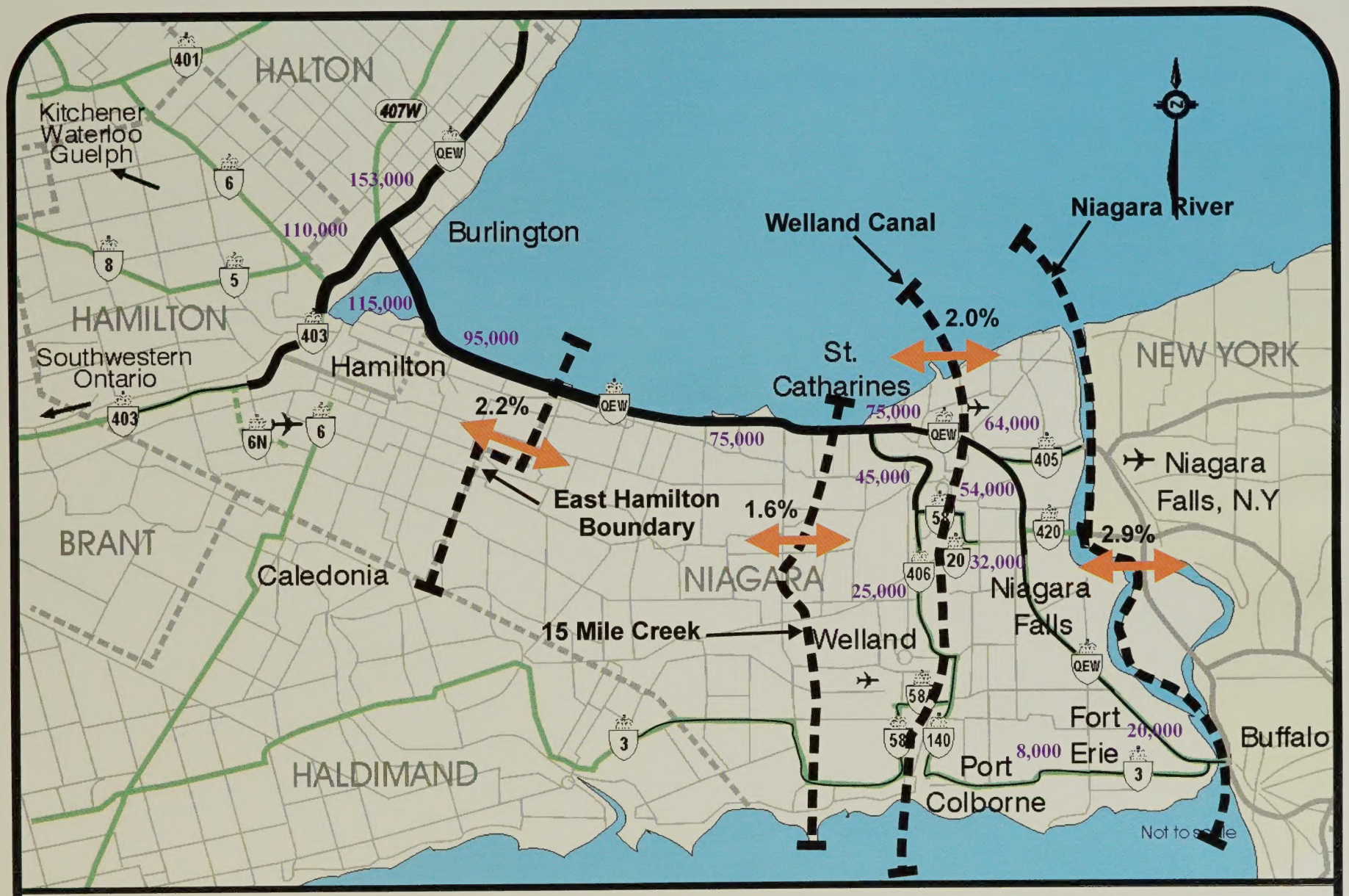
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3112: Year 2031 pmpkhr HIGH - Base Network

01-05-09 10:43
MODULE: 2.13
TSH.....dd

APPENDIX J

Transportation Problems

APPENDIX J
NETWORK CHARACTERISTICS



Provincial Highway Network Characteristics

Legend:
95,000 - 1999 AADT
Per annum growth to 2031
Screen line

APPENDIX J
BASE NETWORK – SCREENLINE ANALYSIS

MTO Niagara Needs Assessment
Screenline Volume Assessment
2021 - P.M. Peak Hour
Base Network - Low Tourist Condition

		Northbound/Eastbound						Southbound/Westbound					
Screenline	Link	Modelled	Capacity	v/c	Modelled sl	Capacity sl	sl v/c	Modelled	Capacity	Diff	Modelled sl	Capacity sl	sl v/c
Region of Hamilton-Wentworth													
Hamilton West Boundary	Highway 6	495	2400	0.21				134	2400	0.06			
	RR 35	461	1200	0.38				51	1200	0.04			
	RR 97	-	1200	-				-	1200	-			
	Highway 8	610	1200	0.51				885	1200	0.74			
	Highway 5	49	1200	0.04				161	1200	0.13			
	Governors Rd	-	1200	-	1,616	8,400	0.19	-	1200	-	1,231	8,400	0.15
Hamilton East Boundary	Highway QEW	5,598	5400	1.04				4,573	5400	0.85			
	S. Service Rd	448	1200	0.37				282	1200	0.24			
	Highway 8	786	1200	0.65				422	1200	0.35			
	Ridge Rd.	540	1200	0.45				20	1200	0.02			
	Mud Street	639	1200	0.53				389	1200	0.32			
	Highway 20	339	900	0.38				220	900	0.24			
	Binbrook Road	415	1200	0.35	8,765	12,300	0.71	142	1200	0.12	6,047	12,300	0.49
West Gateway (KW-Cambridge)	Highway 401	2,685	10800	0.25				3,870	10800	0.36			
	Regional Rd 35	51	10800	0.00				461	10800	0.04			
	Highway 8	610	10800	0.06	3,346	32,400	0.10	885	10800	0.08	5,217	32,400	0.16
Hamilton Escarpment	Sydenham Rd	573	1200	0.48				341	1200	0.28			
	Highway 8	376	650	0.58				668	650	1.03			
	Governor's Rd	257	800	0.32				817	800	1.02			
	Highway 2	196	800	0.25	1,402	3,450	0.41	1,380	1600	0.86	3,206	4,250	0.75
	Highway 403	2,455	5400	0.45				6,675	5400	1.24			
	Beckett Dr	548	650	0.84				1,076	650	1.66			
	James St	171	650	0.26				1,204	650	1.85			
	Claremont Access	842	2400	0.35				3,681	2400	1.53			
	Jolley Cut	932	1600	0.58				2,278	1600	1.42			
	Sherman Access	212	650	0.33									
	Kennilworth Ave	452	1300	0.35	5,613	12,650	0.44	1,696	1300	1.30	16,609	12,000	1.38
	Red Hill Creek Expressway	2,417	3600	0.67				4,063	3600	1.13			
	Mt. Albion Rd	175	400	0.44				628	400	1.57			
	Centennial Parkway	1,003	1600	0.63	3,595	5,600	0.64	2,250	1600	1.41	6,941	5,600	1.24
Hamilton North Boundary	Beach Blvd	444	650	0.68				719	650	1.11			
	QEW	5,330	6000	0.89				6,633	6000	1.11			
	York Rd (Plains Rd E)	345	1600	0.22				906	1600	0.57			
	Highway 403	4,880	7200	0.68				7,094	7200	0.99			
	Mill Street	255	650	0.39				772	650	1.19			
	Highway 5	606	1200	0.51				1,742	1200	1.45			
	Parkside Dr	23	1200	0.02				1,181	1200	0.98			
	6th Concession	-	1200	-				-	1200	-			
	7th Concession	35	1200	0.03				760	1200	0.63			
	Carlisle Rd	8	1200	0.01				885	1200	0.74			
	11 th Concession	34	1200	0.03				746	1200	0.62			
	Campbellville Rd	160	1200	0.13				936	1200	0.78			
	Highway 401	2,540	5400	0.47	14,658	29,900	0.49	5,833	5400	1.08	28,206	29,900	0.94
Hamilton South Boundary	Jerseyville Rd	-	1200	-				-	1200	-			
	Highway 2/53	467	1200	0.39				1,483	1200	1.24			
	Carluke St	191	1200	0.16				111	1200	0.09			
	Highway 6	326	2400	0.14				1,506	2400	0.63			
	Tyensdale	-	1200	-				-	1200	-			
	Blackheath Rd	-	1200	-				-	1200	-			
	Highway 56	104	1200	0.09	1,088	9,600	0.11	475	1200	0.40	3,574	9,600	0.37
North of Highway 5	Milborough	805	900	0.89				20	900	0.02			
	Evans Rd	259	400	0.65				205	400	0.51			
	Main St	401	650	0.62				77	650	0.12			
	Hamilton St	768	1600	0.48				264	1600	0.17			
	Highway 6	1,775	2400	0.74				1,045	2400	0.44			
	Millgrove Side Road	162	1200	0.14				323	1200	0.27			
	Brock Rd N	20	650	0.03				61	1300	0.05			
	Westover Rd	102	1200	0.09				734	1200	0.61			
	Highway 8	752	1200	0.63				427	1200	0.36			
	Woodhill Rd	117	1200	0.10				141	1200	0.12			
	Sheffield Rd	3	1200	0.00	5,164	12,600	0.41	271	1200	0.23	3,568	13,250	0.27

MTO Niagara Needs Assessment
Screenline Volume Assessment
2021 - P.M. Peak Hour
Base Network - Low Tourist Condition

Region of Niagara

Niagara River	Queenston/Lewiston Bridge	1,131	1,600	0.71				1,003	1,600	0.63			
	Whirlpool Bridge	147	400	0.37				301	400	0.75			
	Rainbow Bridge	994	1,300	0.76				965	1,300	0.74			
	Peace Bridge	1,344	1,600	0.84	3,616	4,900	0.74	1,832	1,600	1.15	4,102	4,900	0.84
East of QEW	Hwy 405	1,711	3,600	0.48				1,282	1,800	0.71			
	Mountain Rd	539	800	0.67				427	800	0.53			
	Thorold Stone Rd	1,092	800	1.36				931	800	1.16			
	Hwy 420	2,443	2,400	1.02				3,241	3,600	0.90			
	Lundy's Lane	1,274	1,600	0.80				1,428	1,600	0.89			
	McLeod Rd	1,184	1,600	0.74				1,179	1,600	0.74			
	Lyons Creek Rd	890	800	1.11				682	800	0.85			
	Sodom Rd	16	800	0.02	9,147	12,400	0.74	53	800	0.07	9,223	11,800	0.78
West of QEW	Mountain Rd	452	800	0.57				524	800	0.65			
	Thorold Stone Rd	990	800	1.24				1,039	800	1.30			
	Hwy 420	740	800	0.93				1,173	800	1.47			
	Lundy's Lane / Hwy 20	1,274	1,600	0.80				1,428	1,600	0.89			
	McLeod Rd	1,059	1,600	0.66				1,205	1,600	0.75			
	Lyons Creek Rd	770	800	0.96				815	800	1.02			
	Sodom Rd	411	900	0.46	5,696	7,300	0.78	481	900	0.53	6,664	7,300	0.91
South of QEW - St. Cath	Martindale Rd	568	800	0.71				1,127	800	1.41			
	Ontario St.	594	1300	0.46				348	1300	0.27			
	Lake St	1,147	1300	0.88				924	1300	0.71			
	on/off ramp	628	900	0.70				766	900	0.85			
	Geneva St	1,308	1300	1.01				1,539	1300	1.18			
	offramp	-	-	#VALUE!				358	1200	0.30			
	Niagara St	1,612	1300	1.24				931	1300	0.72			
	Welland Ave	728	1600	0.46				828	1600	0.52			
	on ramp	1,232	1200	1.03				-	-	#VALUE!			
	Bunting Rd	1,011	1300	0.78				334	1300	0.26			
	Dieppe Rd	251	650	0.39				305	650	0.47			
	Cushman Rd	130	650	0.20				51	650	0.08			
	Government Rd	427	800	0.53	9,634	13,100	0.74	530	800	0.66	8,042	13,100	0.61
Welland Canal North	Lakeshore Rd	665	800	0.83				688	800	0.86			
	Carlton St	559	400	1.40				497	400	1.24			
	QEW	4,926	4,500	1.09				4,497	4,500	1.00			
	Queenston St	939	800	1.17				886	800	1.11			
	Glendale Ave	290	800	0.36	7,379	7,300	1.01	382	800	0.48	6,951	7,300	0.95
Welland Canal Central	Hwy 58	1,504	1,600	0.94				1,195	1,600	0.75			
	Hwy 20	926	900	1.03	2,430	2,500	0.97	803	900	0.89	1,998	2,500	0.80
Welland Canal South	East Main St	848	900	0.94				759	900	0.84			
	Townline Tunnel Rd (Hwy 58A)	726	900	0.81				674	900	0.75			
	Main St E (Hwy 3)	200	900	0.22				188	900	0.21			
	Clarence St	180	800	0.23	1,955	3,500	0.56	222	800	0.28	1,843	3,500	0.53
15 Mile Creek	QEW	5,652	5,400	1.05				4,893	5,400	0.91			
	Fourth Ave	703	900	0.78				705	900	0.78			
	St. Paul St	529	800	0.66				457	800	0.57			
	Eighth Ave	463	800	0.58	7,347	7,900	0.93	241	800	0.30	6,296	7,900	0.80
W Lincoln/Pelham Bdry	Sixteen Rd	192	800	0.24				167	800	0.21			
	Hwy 20	499	900	0.55				231	900	0.26			
	Canboro Rd	152	800	0.19				172	800	0.22			
	Webber Rd	515	900	0.57	1,358	3,400	0.40	466	900	0.52	1,036	3,400	0.30
Escarpment Central	Government Rd	609	800	0.76				513	800	0.64			
	Merritt St	518	1,300	0.40				410	1,300	0.32			
	Burleigh Dr	193	650	0.30				341	650	0.52			
	Hwy 406	2,474	2,400	1.03				2,580	2,400	1.07			
	Glenridge Ave	532	650	0.82	4,326	5,800	0.75	586	650	0.90	4,428	5,800	0.76
Escarpment West	Pelham Rd	127	650	0.19				370	650	0.57			
	First St Louth	513	800	0.64				359	800	0.45			
	Glen Rd	92	800	0.12				182	800	0.23			
	Victoria Ave	394	800	0.49				381	800	0.48			
	Campden Rd	16	800	0.02				69	800	0.09			
	Beamsville Rd	75	800	0.09				330	800	0.41			
	Thirty St	54	800	0.07				321	800	0.40			
	Park Rd	74	800	0.09				140	800	0.17			
	Mountain Rd	250	900	0.28	1,594	7,150	0.22	278	900	0.31	2,431	7,150	0.34

MTO Niagara Needs Assessment
Screenline Volume Assessment
2021 - P.M. Peak Hour
Base Network - High Tourist Condition

		Northbound/Eastbound						Southbound/Westbound					
Screenline	Link	Modelled	Capacity	v/c	Modelled sl	Capacity sl	sl v/c	Modelled	Capacity	Diff	Modelled sl	Capacity sl	sl v/c
Region of Hamilton-Wentworth													
Hamilton West Boundary	Highway 6	537	2400	0.22				134	2400	0.06			
	RR 35	488	1200	0.41				51	1200	0.04			
	RR 97	-	1200	-				-	1200	-			
	Highway 8	713	1200	0.59				933	1200	0.78			
	Highway 5	49	1200	0.04				161	1200	0.13			
	Governors Rd	-	1200	-	1,788	8,400	0.21	-	1200	-	1,280	8,400	0.15
Hamilton East Boundary	Highway QEW	5,888	5400	1.09				4,802	5400	0.89			
	S. Service Rd	515	1200	0.43				412	1200	0.34			
	Highway 8	844	1200	0.70				556	1200	0.46			
	Ridge Rd.	665	1200	0.55				86	1200	0.07			
	Mud Street	741	1200	0.62				452	1200	0.38			
	Highway 20	421	900	0.47				447	900	0.50			
	Binbrook Road	556	1200	0.46	9,630	12,300	0.78	259	1200	0.22	7,014	12,300	0.57
West Gateway (KW-Cambridge)	Highway 401	2,707	10800	0.25				3,873	10800	0.36			
	Regional Rd 35	51	10800	0.00				488	10800	0.05			
	Highway 8	713	10800	0.07	3,472	32,400	0.11	933	10800	0.09	5,295	32,400	0.16
Hamilton Escarpment	Sydenham Rd	632	1200	0.53				378	1200	0.31			
	Highway 8	387	650	0.60				678	650	1.04			
	Governor's Rd	271	800	0.34				833	800	1.04			
	Highway 2	189	800	0.24	1,480	3,450	0.43	1,419	1600	0.89	3,308	4,250	0.78
	Highway 403	2,471	5400	0.46				6,704	5400	1.24			
	Beckett Dr	565	650	0.87				1,097	650	1.69			
	James St	170	650	0.26				1,185	650	1.82			
	Claremont Access	852	2400	0.36				3,731	2400	1.55			
	Jolley Cut	923	1600	0.58				2,295	1600	1.43			
	Sherman Access	208	650	0.32									
	Kennilworth Ave	453	1300	0.35	5,643	12,650	0.45	1,704	1300	1.31	16,716	12,000	1.39
	Red Hill Creek Expressway	2,402	3600	0.67				4,012	3600	1.11			
	Mt. Albion Rd	193	400	0.48				634	400	1.59			
	Centennial Parkway	1,102	1600	0.69	3,698	5,600	0.66	2,302	1600	1.44	6,949	5,600	1.24
Hamilton North Boundary	Beach Blvd	473	650	0.73				744	650	1.14			
	QEW	5,567	6000	0.93				6,729	6000	1.12			
	York Rd (Plains Rd E)	368	1600	0.23				957	1600	0.60			
	Highway 403	4,962	7200	0.69				7,189	7200	1.00			
	Mill Street	231	650	0.36				774	650	1.19			
	Highway 5	640	1200	0.53				1,786	1200	1.49			
	Parkside Dr	31	1200	0.03				1,184	1200	0.99			
	6th Concession	-	1200	-				-	1200	-			
	7th Concession	35	1200	0.03				800	1200	0.67			
	Carlisle Rd	8	1200	0.01				882	1200	0.74			
	11 th Concession	34	1200	0.03				736	1200	0.61			
	Campbellville Rd	163	1200	0.14				901	1200	0.75			
	Highway 401	2,528	5400	0.47	15,040	29,900	0.50	5,846	5400	1.08	28,528	29,900	0.95
Hamilton South Boundary	Jerseyville Rd	-	1200	-				-	1200	-			
	Highway 2/53	467	1200	0.39				1,483	1200	1.24			
	Carluke St	293	1200	0.24				111	1200	0.09			
	Highway 6	326	2400	0.14				1,506	2400	0.63			
	Tyensdale	-	1200	-				-	1200	-			
	Blackheath Rd	-	1200	-				-	1200	-			
	Highway 56	104	1200	0.09	1,190	9,600	0.12	475	1200	0.40	3,574	9,600	0.37
North of Highway 5	Milborough	779	900	0.87				19	900	0.02			
	Evans Rd	274	400	0.69				214	400	0.54			
	Main St	415	650	0.64				75	650	0.11			
	Hamilton St	773	1600	0.48				267	1600	0.17			
	Highway 6	1,791	2400	0.75				1,084	2400	0.45			
	Millgrove Side Road	161	1200	0.13				309	1200	0.26			
	Brock Rd N	20	650	0.03				74	1300	0.06			
	Westover Rd	112	1200	0.09				788	1200	0.66			
	Highway 8	805	1200	0.67				414	1200	0.34			
	Woodhill Rd	110	1200	0.09				149	1200	0.12			
	Sheffield Rd	27	1200	0.02	5,267	12,600	0.42	378	1200	0.31	3,770	13,250	0.28

MTO Niagara Needs Assessment
Screenline Volume Assessment
2021 - P.M. Peak Hour
Base Network - High Tourist Condition

Region of Niagara													
Niagara River	Queenston/Lewiston Bridge	1,424	1,600	0.89				1,523	1,600	0.95			
	Whirlpool Bridge	213	400	0.53				535	400	1.34			
	Rainbow Bridge	1,089	1,300	0.84				962	1,300	0.74			
	Peace Bridge	1,946	2,400	0.81	4,672	8,300	0.56	2,346	2,400	0.98	5,366	8,300	0.65
East of QEW	Hwy 405	2,070	3,600	0.58				1,843	1,800	1.02			
	Mountain Rd	568	800	0.71				559	800	0.70			
	Thorold Stone Rd	1,147	800	1.43				1,083	800	1.35			
	Hwy 420	2,711	2,400	1.13				3,431	3,600	0.95			
	Lundy's Lane	1,339	1,600	0.84				1,476	1,600	0.92			
	McLeod Rd	1,205	1,600	0.75				1,254	1,600	0.78			
	Lyons Creek Rd	865	800	1.08				646	800	0.81			
	Sodom Rd	30	800	0.04	9,936	12,400	0.80	78	800	0.10	10,370	11,800	0.88
West of QEW	Mountain Rd	438	800	0.55				636	800	0.79			
	Thorold Stone Rd	1,055	800	1.32				1,061	800	1.33			
	Hwy 420	861	800	1.08				1,206	800	1.51			
	Lundy's Lane / Hwy 20	1,339	1,600	0.84				1,476	1,600	0.92			
	McLeod Rd	1,038	1,600	0.65				1,316	1,600	0.82			
	Lyons Creek Rd	818	800	1.02				892	800	1.12			
	Sodom Rd	511	900	0.57	6,060	7,300	0.83	481	900	0.53	7,068	7,300	0.97
South of QEW - St. Cath	Martindale Rd	677	800	0.85				1,146	800	1.43			
	Ontario St.	611	1300	0.47				423	1300	0.33			
	Lake St	1,133	1300	0.87				938	1300	0.72			
	on/off ramp	568	900	0.63				658	900	0.73			
	Geneva St	1,318	1300	1.01				1,565	1300	1.20			
	offramp	-	-	#VALUE!				275	1200	0.23			
	Niagara St	1,624	1300	1.25				952	1300	0.73			
	Welland Ave	705	1600	0.44				808	1600	0.51			
	on ramp	1,114	1200	0.93				-	-	#VALUE!			
	Bunting Rd	1,113	1300	0.86				347	1300	0.27			
	Dieppe Rd	288	650	0.44				344	650	0.53			
	Cushman Rd	118	650	0.18				78	650	0.12			
	Government Rd	506	800	0.63	9,775	13,100	0.75	621	800	0.78	8,157	13,100	0.62
Welland Canal North	Lakeshore Rd	701	800	0.88				750	800	0.94			
	Carlton St	574	400	1.43				522	400	1.30			
	QEW	5,203	4,500	1.16				4,905	4,500	1.09			
	Queenston St	1,001	800	1.25				1,003	800	1.25			
	Glendale Ave	484	800	0.61	7,963	7,300	1.09	489	800	0.61	7,668	7,300	1.05
Welland Canal Central	Hwy 58	1,696	1,600	1.06				1,435	1,600	0.90			
	Hwy 20	984	900	1.09	2,680	2,500	1.07	897	900	1.00	2,332	2,500	0.93
Welland Canal South	East Main St	943	900	1.05				829	900	0.92			
	Townline Tunnel Rd (Hwy 58A)	792	900	0.88				731	900	0.81			
	Main St E (Hwy 3)	300	900	0.33				222	900	0.25			
	Clarence St	187	800	0.23	2,221	3,500	0.63	230	800	0.29	2,013	3,500	0.58
15 Mile Creek	QEW	5,878	5,400	1.09				5,310	5,400	0.98			
	Fourth Ave	779	900	0.87				744	900	0.83			
	St. Paul St	602	800	0.75				533	800	0.67			
	Eighth Ave	537	800	0.67	7,796	7,900	0.99	380	800	0.48	6,967	7,900	0.88
W Lincoln/Pelham Bdry	Sixteen Rd	327	800	0.41				204	800	0.25			
	Hwy 20	611	900	0.68				369	900	0.41			
	Canboro Rd	151	800	0.19				207	800	0.26			
	Webber Rd	563	900	0.63	1,652	3,400	0.49	503	900	0.56	1,283	3,400	0.38
Escarpment Central	Government Rd	612	800	0.77				585	800	0.73			
	Merritt St	526	1,300	0.40				438	1,300	0.34			
	Burleigh Dr	200	650	0.31				339	650	0.52			
	Hwy 406	2,514	2,400	1.05				2,640	2,400	1.10			
	Glenridge Ave	555	650	0.85	4,408	5,800	0.76	593	650	0.91	4,596	5,800	0.79
Escarpment West	Pelham Rd	146	650	0.22				412	650	0.63			
	First St Louth	511	800	0.64				325	800	0.41			
	Glen Rd	92	800	0.12				197	800	0.25			
	Victoria Ave	458	800	0.57				457	800	0.57			
	Campden Rd	16	800	0.02				100	800	0.12			
	Beamsville Rd	179	800	0.22				395	800	0.49			
	Thirty St	56	800	0.07				389	800	0.49			
	Park Rd	65	800	0.08				93	800	0.12			
	Mountain Rd	203	900	0.23	1,725	7,150	0.24	343	900	0.38	2,711	7,150	0.38

MTO Niagara Needs Assessment
Screenline Volume Assessment
2031 - P.M. Peak Hour
Base Network- Low Tourist Condition

		Nothbound/Eastbound						Southbound/Westbound					
Screenline	Link	Modelled	Capacity	v/c	Modelled sl	Capacity sl	sl v/c	Modelled	Capacity	Diff	Modelled sl	Capacity sl	sl v/c
Region of Hamilton-Wentworth													
Hamilton West Boundary	Highway 6	578	2400	0.24				184	2400	0.08			
	RR 35	490	1200	0.41				53	1200	0.04			
	RR 97	-	1200	-				-	1200	-			
	Highway 8	699	1200	0.58				1,025	1200	0.85			
	Highway 5	51	1200	0.04				165	1200	0.14			
	Governors Rd	-	1200	-	1,817	8,400	0.22	-	1200	-	1,427	8,400	0.17
Hamilton East Boundary	Highway QEW	5,801	5400	1.07				4,702	5400	0.87			
	S. Service Rd	489	1200	0.41				339	1200	0.28			
	Highway 8	836	1200	0.70				468	1200	0.39			
	Ridge Rd.	612	1200	0.51				50	1200	0.04			
	Mud Street	702	1200	0.58				430	1200	0.36			
	Highway 20	399	900	0.44				343	900	0.38			
	Binbrook Road	491	1200	0.41	9,330	12,300	0.76	211	1200	0.18	6,542	12,300	0.53
West Gateway (KW-Cambridge)	Highway 401	3,100	10800	0.29				4,204	10800	0.39			
	Regional Rd 35	53	10800	0.00				490	10800	0.05			
	Highway 8	699	10800	0.06	3,851	32,400	0.12	1,025	10800	0.09	5,719	32,400	0.18
Hamilton Escarpment	Sydenham Rd	719	1200	0.60				444	1200	0.37			
	Highway 8	411	650	0.63				701	650	1.08			
	Governor's Rd	273	800	0.34				861	800	1.08			
	Highway 2	208	800	0.26	1,611	3,450	0.47	1,478	1600	0.92	3,485	4,250	0.82
	Highway 403	2,549	5400	0.47				6,779	5400	1.26			
	Beckett Dr	568	650	0.87				1,107	650	1.70			
	James St	180	650	0.28				1,242	650	1.91			
	Claremont Access	869	2400	0.36				3,800	2400	1.58			
	Jolley Cut	944	1600	0.59				2,309	1600	1.44			
	Sherman Access	214	650	0.33									
	Kennilworth Ave	477	1300	0.37	5,800	12,650	0.46	1,746	1300	1.34	16,982	12,000	1.42
	Red Hill Creek Expressway	2,503	3600	0.70				4,093	3600	1.14			
	Mt. Albion Rd	193	400	0.48				635	400	1.59			
	Centennial Parkway	1,095	1600	0.68	3,791	5,600	0.68	2,300	1600	1.44	7,029	5,600	1.26
Hamilton North Boundary	Beach Blvd	505	650	0.78				766	650	1.18			
	QEW	5,665	6000	0.94				6,772	6000	1.13			
	York Rd (Plains Rd E)	405	1600	0.25				957	1600	0.60			
	Highway 403	5,103	7200	0.71				7,291	7200	1.01			
	Mill Street	336	650	0.52				789	650	1.21			
	Highway 5	696	1200	0.58				1,811	1200	1.51			
	Parkside Dr	25	1200	0.02				1,263	1200	1.05			
	6th Concession	-	1200	-				-	1200	-			
	7th Concession	35	1200	0.03				958	1200	0.80			
	Carlisle Rd	9	1200	0.01				971	1200	0.81			
	11 th Concession	38	1200	0.03				904	1200	0.75			
	Campbellville Rd	188	1200	0.16				899	1200	0.75			
	Highway 401	2,840	5400	0.53	15,846	29,900	0.53	6,072	5400	1.12	29,451	29,900	0.98
Hamilton South Boundary	Jerseyville Rd	-	1200	-				-	1200	-			
	Highway 2/53	480	1200	0.40				1,520	1200	1.27			
	Carluke St	270	1200	0.23				114	1200	0.10			
	Highway 6	335	2400	0.14				1,544	2400	0.64			
	Tyensdale	-	1200	-				-	1200	-			
	Blackheath Rd	-	1200	-				-	1200	-			
	Highway 56	107	1200	0.09	1,192	9,600	0.12	487	1200	0.41	3,664	9,600	0.38
North of Highway 5	Milborough	816	900	0.91				30	900	0.03			
	Evans Rd	302	400	0.75				354	400	0.89			
	Main St	432	650	0.66				84	650	0.13			
	Hamilton St	829	1600	0.52				331	1600	0.21			
	Highway 6	1,862	2400	0.78				988	2400	0.41			
	Millgrove Side Road	171	1200	0.14				383	1200	0.32			
	Brock Rd N	21	650	0.03				108	1300	0.08			
	Westover Rd	118	1200	0.10				848	1200	0.71			
	Highway 8	823	1200	0.69				371	1200	0.31			
	Woodhill Rd	115	1200	0.10				226	1200	0.19			
	Sheffield Rd	27	1200	0.02	5,515	12,600	0.44	412	1200	0.34	4,135	13,250	0.31

MTO Niagara Needs Assessment
Screenline Volume Assessment
2031 - P.M. Peak Hour
Base Network- Low Tourist Condition

Region of Niagara													
Niagara River	Queenston/Lewiston Bridge	1,163	1,600	0.73				1,137	1,600	0.71			
	Whirlpool Bridge	236	400	0.59				399	400	1.00			
	Rainbow Bridge	1,081	1,300	0.83				1,064	1,300	0.82			
	Peace Bridge	1,643	1,600	1.03	4,123	4,900	0.84	2,060	1,600	1.29	4,660	4,900	0.95
East of QEW	Hwy 405	1,722	3,600	0.48				1,438	1,800	0.80			
	Mountain Rd	579	800	0.72				473	800	0.59			
	Thorold Stone Rd	1,129	800	1.41				981	800	1.23			
	Hwy 420	2,586	2,400	1.08				3,292	3,600	0.91			
	Lundy's Lane	1,297	1,600	0.81				1,463	1,600	0.91			
	McLeod Rd	1,227	1,600	0.77				1,255	1,600	0.78			
	Lyons Creek Rd	892	800	1.12				679	800	0.85			
	Sodom Rd	33	800	0.04	9,466	12,400	0.76	76	800	0.09	9,657	11,800	0.82
West of QEW	Mountain Rd	490	800	0.61				591	800	0.74			
	Thorold Stone Rd	1,046	800	1.31				1,069	800	1.34			
	Hwy 420	836	800	1.04				1,222	800	1.53			
	Lundy's Lane / Hwy 20	1,297	1,600	0.81				1,463	1,600	0.91			
	McLeod Rd	1,100	1,600	0.69				1,319	1,600	0.82			
	Lyons Creek Rd	793	800	0.99				875	800	1.09			
	Sodom Rd	472	900	0.52	6,035	7,300	0.83	486	900	0.54	7,024	7,300	0.96
South of QEW - St. Cath	Martindale Rd	646	800	0.81				1,169	800	1.46			
	Ontario St.	611	1300	0.47				333	1300	0.26			
	Lake St	1,202	1300	0.92				963	1300	0.74			
	on/off ramp	628	900	0.70				768	900	0.85			
	Geneva St	1,352	1300	1.04				1,560	1300	1.20			
	offramp	-	-					368	1200	0.31			
	Niagara St	1,619	1300	1.25				963	1300	0.74			
	Welland Ave	767	1600	0.48				869	1600	0.54			
	on ramp	1,203	1200	1.00				-	-				
	Bunting Rd	1,120	1300	0.86				352	1300	0.27			
	Dieppe Rd	300	650	0.46				344	650	0.53			
	Cushman Rd	95	650	0.15				75	650	0.12			
	Government Rd	494	800	0.62	10,039	13,100	0.77	621	800	0.78	8,384	13,100	0.64
Welland Canal North	Lakeshore Rd	697	800	0.87				708	800	0.89			
	Carlton St	566	400	1.41				527	400	1.32			
	QEW	5,064	4,500	1.13				4,663	4,500	1.04			
	Queenston St	976	800	1.22				941	800	1.18			
	Glendale Ave	397	800	0.50	7,700	7,300	1.05	442	800	0.55	7,281	7,300	1.00
Welland Canal Central	Hwy 58	1,596	1,600	1.00				1,302	1,600	0.81			
	Hwy 20	969	900	1.08	2,565	2,500	1.03	867	900	0.96	2,168	2,500	0.87
Welland Canal South	East Main St	920	900	1.02				804	900	0.89			
	Townline Tunnel Rd (Hwy 58A)	799	900	0.89				736	900	0.82			
	Main St E (Hwy 3)	239	900	0.27				204	900	0.23			
	Clarence St	189	800	0.24	2,146	3,500	0.61	232	800	0.29	1,976	3,500	0.56
15 Mile Creek	QEW	5,740	5,400	1.06				5,080	5,400	0.94			
	Fourth Ave	785	900	0.87				730	900	0.81			
	St. Paul St	586	800	0.73				514	800	0.64			
	Eighth Ave	523	800	0.65	7,635	7,900	0.97	329	800	0.41	6,654	7,900	0.84
W Lincoln/Pelham Bdry	Sixteen Rd	266	800	0.33				197	800	0.25			
	Hwy 20	575	900	0.64				280	900	0.31			
	Canboro Rd	146	800	0.18				192	800	0.24			
	Webber Rd	558	900	0.62	1,546	3,400	0.45	485	900	0.54	1,153	3,400	0.34
Escarpment Central	Government Rd	644	800	0.80				592	800	0.74			
	Merritt St	531	1,300	0.41				437	1,300	0.34			
	Burleigh Dr	210	650	0.32				329	650	0.51			
	Hwy 406	2,521	2,400	1.05				2,620	2,400	1.09			
	Glenridge Ave	556	650	0.86	4,462	5,800	0.77	618	650	0.95	4,597	5,800	0.79
Escarpment West	Pelham Rd	152	650	0.23				426	650	0.66			
	First St Louth	519	800	0.65				345	800	0.43			
	Glen Rd	91	800	0.11				199	800	0.25			
	Victoria Ave	417	800	0.52				410	800	0.51			
	Campden Rd	17	800	0.02				92	800	0.11			
	Beamsville Rd	165	800	0.21				399	800	0.50			
	Thirty St	56	800	0.07				379	800	0.47			
	Park Rd	117	800	0.15				145	800	0.18			
	Mountain Rd	210	900	0.23	1,744	7,150	0.24	327	900	0.36	2,722	7,150	0.38

MTO Niagara Needs Assessment
Screenline Volume Assessment
2031 - P.M. Peak Hour
Base Network- High Tourist Condition

Screenline	Link	Northbound/Eastbound						Southbound/Westbound					
		Modelled	Capacity	v/c	Modelled sl	Capacity sl	sl v/c	Modelled	Capacity	Diff	Modelled sl	Capacity sl	sl v/c
Region of Hamilton-Wentworth													
Hamilton West Boundary	Highway 6	690	2400	0.29				185	2400	0.08			
	RR 35	526	1200	0.44				53	1200	0.04			
	RR 97	-	1200	-				-	1200	-			
	Highway 8	816	1200	0.68				1,075	1200	0.90			
	Highway 5	51	1200	0.04				165	1200	0.14			
	Governors Rd	-	1200	-	2,083	8,400	0.25	-	1200	-	1,477	8,400	0.18
Hamilton East Boundary	Highway QEW	6,071	5400	1.12				4,968	5400	0.92			
	S. Service Rd	584	1200	0.49				472	1200	0.39			
	Highway 8	919	1200	0.77				641	1200	0.53			
	Ridge Rd.	718	1200	0.60				142	1200	0.12			
	Mud Street	858	1200	0.71				530	1200	0.44			
	Highway 20	530	900	0.59				568	900	0.63			
	Binbrook Road	651	1200	0.54	10,331	12,300	0.84	343	1200	0.29	7,664	12,300	0.62
West Gateway (KW-Cambridge)	Highway 401	3,130	10800	0.29				4,210	10800	0.39			
	Regional Rd 35	53	10800	0.00				526	10800	0.05			
	Highway 8	816	10800	0.08	3,999	32,400	0.12	1,075	10800	0.10	5,811	32,400	0.18
Hamilton Escarpment	Sydenham Rd	730	1200	0.61				445	1200	0.37			
	Highway 8	445	650	0.68				696	650	1.07			
	Governor's Rd	292	800	0.37				875	800	1.09			
	Highway 2	209	800	0.26	1,676	3,450	0.49	1,481	1600	0.93	3,498	4,250	0.82
	Highway 403	2,570	5400	0.48				6,862	5400	1.27			
	Beckett Dr	570	650	0.88				1,125	650	1.73			
	James St	180	650	0.28				1,211	650	1.86			
	Claremont Access	880	2400	0.37				3,840	2400	1.60			
	Jolley Cut	944	1600	0.59				2,363	1600	1.48			
	Sherman Access	209	650	0.32									
	Kennilworth Ave	478	1300	0.37	5,831	12,650	0.46	1,747	1300	1.34	17,148	12,000	1.43
	Red Hill Creek Expressway	2,448	3600	0.68				4,055	3600	1.13			
	Mt. Albion Rd	214	400	0.54				652	400	1.63			
	Centennial Parkway	1,177	1600	0.74	3,839	5,600	0.69	2,334	1600	1.46	7,041	5,600	1.26
Hamilton North Boundary	Beach Blvd	624	650	0.96				798	650	1.23			
	QEW	5,881	6000	0.98				6,879	6000	1.15			
	York Rd (Plains Rd E)	402	1600	0.25				1,006	1600	0.63			
	Highway 403	5,136	7200	0.71				7,331	7200	1.02			
	Mill Street	267	650	0.41				805	650	1.24			
	Highway 5	744	1200	0.62				1,806	1200	1.50			
	Parkside Dr	36	1200	0.03				1,207	1200	1.01			
	6th Concession	-	1200	-				-	1200	-			
	7th Concession	36	1200	0.03				851	1200	0.71			
	Carlisle Rd	10	1200	0.01				987	1200	0.82			
	11 th Concession	38	1200	0.03				873	1200	0.73			
	Campbellville Rd	191	1200	0.16				1,017	1200	0.85			
	Highway 401	2,840	5400	0.53	16,206	29,900	0.54	6,155	5400	1.14	29,714	29,900	0.99
Hamilton South Boundary	Jerseyville Rd	-	1200	-				-	1200	-			
	Highway 2/53	480	1200	0.40				1,520	1200	1.27			
	Carluke St	302	1200	0.25				144	1200	0.12			
	Highway 6	335	2400	0.14				1,544	2400	0.64			
	Tyensdale	-	1200	-				-	1200	-			
	Blackheath Rd	-	1200	-				-	1200	-			
	Highway 56	107	1200	0.09	1,223	9,600	0.13	487	1200	0.41	3,694	9,600	0.38
North of Highway 5	Milborough	871	900	0.97				23	900	0.03			
	Evans Rd	262	400	0.66				256	400	0.64			
	Main St	438	650	0.67				78	650	0.12			
	Hamilton St	819	1600	0.51				292	1600	0.18			
	Highway 6	1,853	2400	0.77				1,164	2400	0.49			
	Millgrove Side Road	172	1200	0.14				392	1200	0.33			
	Brock Rd N	21	650	0.03				141	1300	0.11			
	Westover Rd	130	1200	0.11				846	1200	0.70			
	Highway 8	853	1200	0.71				414	1200	0.35			
	Woodhill Rd	117	1200	0.10				282	1200	0.24			
	Sheffield Rd	107	1200	0.09	5,644	12,600	0.45	469	1200	0.39	4,358	13,250	0.33

MTO Niagara Needs Assessment
Screenline Volume Assessment
2031 - P.M. Peak Hour
Base Network- High Tourist Condition

Region of Niagara													
Niagara River	Queenston/Lewiston Bridge	1,542	1,600	0.96				1,808	1,600	1.13			
	Whirlpool Bridge	377	400	0.94				614	400	1.54			
	Rainbow Bridge	1,221	1,300	0.94				1,152	1,300	0.89			
	Peace Bridge	2,255	2,400	0.94	5,396	8,300	0.65	2,610	2,400	1.09	6,184	8,300	0.75
East of QEW	Hwy 405	2,284	3,600	0.63				2,053	3,600	0.57			
	Mountain Rd	609	800	0.76				625	800	0.78			
	Thorold Stone Rd	1,186	800	1.48				1,152	800	1.44			
	Hwy 420	2,811	2,400	1.17				3,573	2,400	1.49			
	Lundy's Lane	1,387	1,600	0.87				1,527	1,600	0.95			
	McLeod Rd	1,276	1,600	0.80				1,331	1,600	0.83			
	Lyons Creek Rd	902	800	1.13				645	800	0.81			
	Sodom Rd	48	800	0.06	10,503	12,400	0.85	124	800	0.15	11,029	12,400	0.89
West of QEW	Mountain Rd	459	800	0.57				693	800	0.87			
	Thorold Stone Rd	1,124	800	1.40				1,109	800	1.39			
	Hwy 420	871	800	1.09				1,270	800	1.59			
	Lundy's Lane / Hwy 20	1,387	1,600	0.87				1,527	1,600	0.95			
	McLeod Rd	1,124	1,600	0.70				1,365	1,600	0.85			
	Lyons Creek Rd	906	800	1.13				938	800	1.17			
	Sodom Rd	509	900	0.57	6,379	7,300	0.87	523	900	0.58	7,425	7,300	1.02
South of QEW - St. Cath	Martindale Rd	712	800	0.89				1,166	800	1.46			
	Ontario St.	590	1300	0.45				466	1300	0.36			
	Lake St	1,207	1300	0.93				918	1300	0.71			
	on/off ramp	526	900	0.58				692	900	0.77			
	Geneva St	1,335	1300	1.03				1,564	1300	1.20			
	offramp	-	-					258	1200	0.21			
	Niagara St	1,635	1300	1.26				1,007	1300	0.77			
	Welland Ave	789	1600	0.49				788	1600	0.49			
	on ramp	1,050	1200	0.88				-	-				
	Bunting Rd	1,162	1300	0.89				384	1300	0.30			
	Dieppe Rd	349	650	0.54				368	650	0.57			
	Cushman Rd	86	650	0.13				91	650	0.14			
	Government Rd	592	800	0.74	10,033	13,100	0.77	711	800	0.89	8,414	13,100	0.64
Welland Canal North	Lakeshore Rd	769	800	0.96				817	800	1.02			
	Carlton St	581	400	1.45				551	400	1.38			
	QEW	5,302	4,500	1.18				5,083	4,500	1.13			
	Queenston St	1,099	800	1.37				1,069	800	1.34			
	Glendale Ave	614	800	0.77	8,366	7,300	1.15	556	800	0.69	8,076	7,300	1.11
Welland Canal Central	Hwy 58	1,827	1,600	1.14				1,616	1,600	1.01			
	Hwy 20	1,037	900	1.15	2,864	2,500	1.15	931	900	1.03	2,547	2,500	1.02
Welland Canal South	East Main St	1,040	900	1.16				910	900	1.01			
	Townline Tunnel Rd (Hwy 58A)	842	900	0.94				794	900	0.88			
	Main St E (Hwy 3)	382	900	0.42				279	900	0.31			
	Clarence St	192	800	0.24	2,457	3,500	0.70	240	800	0.30	2,223	3,500	0.64
15 Mile Creek	QEW	6,027	5,400	1.12				5,539	5,400	1.03			
	Fourth Ave	851	900	0.95				775	900	0.86			
	St. Paul St	681	800	0.85				604	800	0.76			
	Eighth Ave	582	800	0.73	8,141	7,900	1.03	463	800	0.58	7,382	7,900	0.93
W Lincoln/Pelham Bdry	Sixteen Rd	397	800	0.50				238	800	0.30			
	Hwy 20	665	900	0.74				483	900	0.54			
	Canboro Rd	195	800	0.24				199	800	0.25			
	Webber Rd	637	900	0.71	1,893	3,400	0.56	555	900	0.62	1,475	3,400	0.43
Escarpment Central	Government Rd	685	800	0.86				663	800	0.83			
	Merritt St	564	1,300	0.43				482	1,300	0.37			
	Burleigh Dr	209	650	0.32				331	650	0.51			
	Hwy 406	2,530	2,400	1.05				2,679	2,400	1.12			
	Glenridge Ave	575	650	0.89	4,563	5,800	0.79	648	650	1.00	4,803	5,800	0.83
Escarpment West	Pelham Rd	180	650	0.28				472	650	0.73			
	First St Louth	523	800	0.65				318	800	0.40			
	Glen Rd	123	800	0.15				196	800	0.25			
	Victoria Ave	471	800	0.59				535	800	0.67			
	Campden Rd	17	800	0.02				87	800	0.11			
	Beamsville Rd	261	800	0.33				486	800	0.61			
	Thirty St	83	800	0.10				490	800	0.61			
	Park Rd	67	800	0.08				88	800	0.11			
	Mountain Rd	196	900	0.22	1,920	7,150	0.27	356	900	0.40	3,029	7,150	0.42

APPENDIX J
BASE NETWORK – FACILITY LEVEL OF SERVICE

MTO - Niagara Needs Assessment
Corridor Assessment
Base Network
Low Tourist Condition
Year 2011 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,803	216	2,019	0.0%	-	2,019	25%	2,523	3,600	0.56	0.70	B	C
	Hwy 420	Hwy 405	2,990	209	3,199	0.0%	-	3,199	25%	3,999	5,400	0.59	0.74	B	C
	Hwy 405	RR 55	3,823	345	4,168	0.0%	-	4,168	38%	5,752	5,400	0.77	1.07	C	F
	RR 55	Ontario Street	3,823	345	4,168	0.0%	-	4,168	38%	5,752	4,500	0.93	1.28	E	F
	Ontario Street	Hwy 406	3,620	305	3,925	0.0%	-	3,925	38%	5,416	5,400	0.73	1.00	C	F
	Hwy 406	Fruitland	4,534	381	4,915	0.0%	-	4,915	25%	6,144	5,400	0.91	1.14	E	F
	Fruitland	Hwy 20	4,156	428	4,584	0.0%	-	4,584	3%	4,722	5,400	0.85	0.87	D	D
	Hwy 20	Hwy 403	5,215	441	5,656	0.0%	-	5,656	3%	5,826	6,000	0.94	0.97	E	E
Hwy 403	Brantford	Hwy 2	1,217	-	1,217	15.0%	182	1,399	3%	1,441	2,400	0.58	0.60	B	B
	Hwy 2	RHC Express.	2,695	91	2,786	15.0%	404	3,190	3%	3,286	3,600	0.89	0.91	D	E
	RHC Express.	Aberdeen	3,198	91	3,289	15.0%	480	3,769	3%	3,882	3,600	1.05	1.08	F	F
	Aberdeen	Hwy 6	6,446	73	6,518	0.0%	-	6,518	3%	6,714	6,000	1.09	1.12	F	F
	Hwy 6	QEW	6,712	68	6,780	0.0%	-	6,780	3%	6,983	5,400	1.26	1.29	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,418	-	1,418	6.5%	92	1,511	3%	1,556	1,600	0.94	0.97	E	E
	Rymal Rd	RHC Express.	1,183	-	1,183	6.5%	77	1,260	3%	1,298	1,600	0.79	0.81	C	D
	RHC Express.	Claremont	1,483	-	1,483	6.5%	96	1,580	3%	1,627	2,000	0.79	0.81	C	D
Hwy 53	Hwy 2	Fiddlers Green	120	-	120	12.0%	14	134	3%	138	2,400	0.06	0.06	A	A
	Fiddlers Green	Hwy 6	431	-	431	12.0%	52	482	3%	497	1,200	0.40	0.41	A	A
	Hwy 6	Hwy 56	895	-	895	12.0%	107	1,003	3%	1,033	2,400	0.42	0.43	A	A
Hwy 20	QEW	Queenston	1,863	114	1,977	0.0%	-	1,977	25%	2,471	1,600	1.24	1.54	F	F
	Queenston	Mud St	2,059	-	2,059	0.0%	-	2,059	25%	2,573	1,600	1.29	1.61	F	F
	Mud St	Hwy 53	991	-	991	0.0%	-	991	25%	1,239	2,400	0.41	0.52	A	B
	Hwy 53	RR 27	330	-	330	7.0%	23	353	25%	442	2,400	0.15	0.18	A	A
	RR 27	Fonthill	117	10	128	7.0%	8	136	25%	170	900	0.15	0.19	A	A
	Fonthill	Hwy 406	1,032	-	1,032	7.0%	72	1,105	25%	1,381	1,800	0.61	0.77	B	C
	Hwy 406	Hwy 58	829	-	829	7.0%	58	887	25%	1,108	900	0.99	1.23	E	F
	Hwy 58	Montrose Rd	1,049	-	1,049	7.0%	73	1,123	25%	1,404	1,600	0.70	0.88	C	D
Hwy 405	QEW	Q-L Bridge	1,223	136	1,359	0.0%	-	1,359	38%	1,875	3,600	0.38	0.52	A	B
Hwy 420	QEW	Stanley Ave	1,824	22	1,847	0.0%	-	1,847	25%	2,308	3,600	0.51	0.64	B	B
Hwy 58	Hwy 406	Hwy 3	609	-	609	0.0%	-	609	3%	627	900	0.68	0.70	C	C
Hwy 140	Welland	Hwy 3	358	-	358	7.0%	25	383	3%	394	800	0.48	0.49	A	A
Hwy 3	Fort Erie	Hwy 140	422	-	422	4.5%	19	441	3%	454	1,800	0.24	0.25	A	A
	Hwy140	Hwy 58	181	-	181	4.5%	8	189	3%	195	900	0.21	0.22	A	A
	Hwy 58	Wainfleet	101	-	101	4.5%	5	105	3%	108	900	0.12	0.12	A	A
	Wainfleet	West Gateway	29	-	29	4.5%	1	30	3%	31	900	0.03	0.03	A	A
Hwy 406	East Main Street	Hwy 20	967	4	971	0.0%	-	971	3%	1,000	2,400	0.40	0.42	A	A
	Hwy 20	Hwy 58	1,681	4	1,684	0.0%	-	1,684	3%	1,735	2,400	0.70	0.72	C	C
	Hwy 58	Geneva St	2,425	4	2,429	0.0%	-	2,429	3%	2,501	2,400	1.01	1.04	F	F
	Geneva St	QEW	977	122	1,099	0.0%	-	1,099	3%	1,132	2,400	0.46	0.47	A	A
RHC Expressway	QEW	Barton	2,865	62	2,927	0.0%	-	2,927	3%	3,014	2,400	1.22	1.26	F	F
	Barton	Queensway	2,928	91	3,019	0.0%	-	3,019	3%	3,110	2,400	1.26	1.30	F	F
	Queensway	King	3,224	91	3,315	0.0%	-	3,315	3%	3,415	2,400	1.38	1.42	F	F
	King	Mud St	3,574	91	3,665	0.0%	-	3,665	3%	3,775	2,400	1.53	1.57	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x)but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Base Network
Low Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M. Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,779	271	2,050	0.0%	-	2,050	25%	2,563	3,600	0.57	0.71	B	C
	Hwy 420	Hwy 405	3,202	271	3,473	0.0%	-	3,473	25%	4,342	5,400	0.64	0.80	B	D
	Hwy 405	RR 55	4,049	438	4,487	0.0%	-	4,487	38%	6,193	5,400	0.83	1.15	D	F
	RR 55	Ontario Street	4,049	438	4,487	0.0%	-	4,487	38%	6,193	4,500	1.00	1.38	E	F
	Ontario Street	Hwy 406	3,984	386	4,370	0.0%	-	4,370	38%	6,030	5,400	0.81	1.12	D	F
	Hwy 406	Fruitland	4,698	477	5,175	0.0%	-	5,175	25%	6,468	5,400	0.96	1.20	E	F
	Fruitland	Hwy 20	4,292	543	4,835	0.0%	-	4,835	3%	4,980	5,400	0.90	0.92	D	E
	Hwy 20	Hwy 403	5,597	518	6,115	0.0%	-	6,115	3%	6,299	6,000	1.02	1.05	F	F
Hwy 403	Brantford	Hwy 2	1,243	-	1,243	15.0%	186	1,429	3%	1,472	2,400	0.60	0.61	B	B
	Hwy 2	RHC Express.	2,645	113	2,758	15.0%	397	3,155	3%	3,249	3,600	0.88	0.90	D	E
	RHC Express.	Aberdeen	3,305	113	3,418	15.0%	496	3,914	3%	4,032	3,600	1.09	1.12	F	F
	Aberdeen	Hwy 6	7,017	90	7,107	0.0%	-	7,107	3%	7,320	6,000	1.18	1.22	F	F
	Hwy 6	QEW	7,293	52	7,344	0.0%	-	7,344	3%	7,564	5,400	1.36	1.40	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,604	-	1,604	6.5%	104	1,708	3%	1,759	1,600	1.07	1.10	F	F
	Rymal Rd	RHC Express.	1,199	-	1,199	6.5%	78	1,277	3%	1,316	1,600	0.80	0.82	C	D
	RHC Express.	Claremont	1,570	-	1,570	6.5%	102	1,672	3%	1,722	2,000	0.84	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	246	-	246	12.0%	30	276	3%	284	2,400	0.11	0.12	A	A
	Fiddlers Green	Hwy 6	608	-	608	12.0%	73	681	3%	702	1,200	0.57	0.58	B	B
	Hwy 6	Hwy 56	996	-	996	12.0%	120	1,116	3%	1,149	2,400	0.47	0.48	A	A
Hwy 20	QEW	Queenston	2,058	135	2,194	0.0%	-	2,194	25%	2,742	1,600	1.37	1.71	F	F
	Queenston	Mud St	2,250	-	2,250	0.0%	-	2,250	25%	2,812	1,600	1.41	1.76	F	F
	Mud St	Hwy 53	1,178	7	1,186	0.0%	-	1,186	25%	1,482	2,400	0.49	0.62	A	B
	Hwy 53	RR 27	680	7	687	7.0%	48	735	25%	918	2,400	0.31	0.38	A	A
	RR 27	Fonthill	388	13	401	7.0%	27	428	25%	535	900	0.48	0.59	A	B
	Fonthill	Hwy 406	1,202	8	1,210	7.0%	84	1,294	25%	1,618	1,800	0.72	0.90	C	D
	Hwy 406	Hwy 58	906	8	914	7.0%	63	978	25%	1,222	900	1.09	1.36	F	F
	Hwy 58	Montrose Rd	1,410	-	1,410	7.0%	99	1,508	25%	1,885	1,600	0.94	1.18	E	F
Hwy 405	QEW	Q-L Bridge	1,272	219	1,491	0.0%	-	1,491	38%	2,058	3,600	0.41	0.57	A	B
Hwy 420	QEW	Stanley Ave	2,090	30	2,119	0.0%	-	2,119	25%	2,649	3,600	0.59	0.74	B	C
Hwy 58	Hwy 406	Hwy 3	610	1	611	0.0%	-	611	3%	629	900	0.68	0.70	C	C
Hwy 140	Welland	Hwy 3	413	-	413	7.0%	29	442	3%	455	800	0.55	0.57	B	B
Hwy 3	Fort Erie	Hwy 140	532	-	532	4.5%	24	556	3%	572	1,800	0.31	0.32	A	A
	Hwy140	Hwy 58	200	-	200	4.5%	9	209	3%	215	900	0.23	0.24	A	A
	Hwy 58	Wainfleet	94	-	94	4.5%	4	99	3%	101	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,091	0	1,092	0.0%	-	1,092	3%	1,124	2,400	0.45	0.47	A	A
	Hwy 20	Hwy 58	1,977	0	1,978	0.0%	-	1,978	3%	2,037	2,400	0.82	0.85	D	D
	Hwy 58	Geneva St	2,577	1	2,578	0.0%	-	2,578	3%	2,655	2,400	1.07	1.11	F	F
	Geneva St	QEW	987	107	1,094	0.0%	-	1,094	3%	1,127	2,400	0.46	0.47	A	A
RHC Expressway	QEW	Barton	2,961	55	3,016	0.0%	-	3,016	3%	3,107	2,400	1.26	1.29	F	F
	Barton	Queensway	2,920	113	3,033	0.0%	-	3,033	3%	3,124	2,400	1.26	1.30	F	F
	Queensway	King	3,265	113	3,378	0.0%	-	3,378	3%	3,479	2,400	1.41	1.45	F	F
	King	Mud St	3,837	113	3,950	0.0%	-	3,950	3%	4,068	2,400	1.65	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Base Network
High Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,771	217	1,988	0.0%	-	1,988	25%	2,485	3,600	0.55	0.69	B	C
	Hwy 420	Hwy 405	3,335	236	3,571	0.0%	-	3,571	25%	4,463	5,400	0.66	0.83	C	D
	Hwy 405	RR 55	4,329	437	4,766	0.0%	-	4,766	38%	6,577	5,400	0.88	1.22	D	F
	RR 55	Ontario Street	4,329	437	4,766	0.0%	-	4,766	38%	6,577	4,500	1.06	1.46	F	F
	Ontario Street	Hwy 406	4,181	392	4,573	0.0%	-	4,573	38%	6,311	5,400	0.85	1.17	D	F
	Hwy 406	Fruitland	4,912	483	5,395	0.0%	-	5,395	25%	6,744	5,400	1.00	1.25	E	F
	Fruitland	Hwy 20	4,577	530	5,107	0.0%	-	5,107	3%	5,261	5,400	0.95	0.97	E	E
	Hwy 20	Hwy 403	5,700	515	6,215	0.0%	-	6,215	3%	6,401	6,000	1.04	1.07	F	F
Hwy 403	Brantford	Hwy 2	1,241	-	1,241	15.0%	186	1,428	3%	1,470	2,400	0.59	0.61	B	B
	Hwy 2	RHC Express.	2,616	99	2,715	15.0%	392	3,107	3%	3,201	3,600	0.86	0.89	D	D
	RHC Express.	Aberdeen	3,310	99	3,409	15.0%	497	3,905	3%	4,022	3,600	1.08	1.12	F	F
	Aberdeen	Hwy 6	7,162	79	7,241	0.0%	-	7,241	3%	7,458	6,000	1.21	1.24	F	F
	Hwy 6	QEW	7,309	62	7,371	0.0%	-	7,371	3%	7,592	5,400	1.36	1.41	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,625	-	1,625	6.5%	106	1,731	3%	1,783	1,600	1.08	1.11	F	F
	Rymal Rd	RHC Express.	1,203	-	1,203	6.5%	78	1,281	3%	1,320	1,600	0.80	0.82	D	D
	RHC Express.	Claremont	1,565	-	1,565	6.5%	102	1,666	3%	1,716	2,000	0.83	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	265	-	265	12.0%	32	296	3%	305	2,400	0.12	0.13	A	A
	Fiddlers Green	Hwy 6	618	0	618	12.0%	74	693	3%	713	1,200	0.58	0.59	B	B
	Hwy 6	Hwy 56	1,074	-	1,074	12.0%	129	1,202	3%	1,238	2,400	0.50	0.52	B	B
Hwy 20	QEW	Queenston	2,141	135	2,275	0.0%	-	2,275	25%	2,844	1,600	1.42	1.78	F	F
	Queenston	Mud St	2,302	-	2,302	0.0%	-	2,302	25%	2,878	1,600	1.44	1.80	F	F
	Mud St	Hwy 53	1,280	13	1,293	0.0%	-	1,293	25%	1,616	2,400	0.54	0.67	B	C
	Hwy 53	RR 27	805	13	818	7.0%	56	875	25%	1,093	2,400	0.36	0.46	A	A
	RR 27	Fonthill	523	25	548	7.0%	37	584	25%	730	900	0.65	0.81	B	D
	Fonthill	Hwy 406	1,341	2	1,343	7.0%	94	1,437	25%	1,796	1,800	0.80	1.00	C	E
	Hwy 406	Hwy 58	989	6	995	7.0%	69	1,065	25%	1,331	900	1.18	1.48	F	F
	Hwy 58	Montrose Rd	1,447	-	1,447	7.0%	101	1,549	25%	1,936	1,600	0.97	1.21	E	F
Hwy 405	QEW	Q-L Bridge	1,634	218	1,852	0.0%	-	1,852	38%	2,556	3,600	0.51	0.71	B	C
Hwy 420	QEW	Stanley Ave	2,176	32	2,207	0.0%	-	2,207	25%	2,759	3,600	0.61	0.77	B	C
Hwy 58	Hwy 406	Hwy 3	594	-	594	0.0%	-	594	3%	612	900	0.66	0.68	C	C
Hwy 140	Welland	Hwy 3	418	-	418	7.0%	29	447	3%	461	800	0.56	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	702	-	702	4.5%	32	734	3%	756	1,800	0.41	0.42	A	A
	Hwy140	Hwy 58	265	18	282	4.5%	12	294	3%	303	900	0.33	0.34	A	A
	Hwy 58	Wainfleet	96	-	96	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,165	0	1,166	0.0%	-	1,166	3%	1,200	2,400	0.49	0.50	A	B
	Hwy 20	Hwy 58	2,042	0	2,042	0.0%	-	2,042	3%	2,104	2,400	0.85	0.88	D	D
	Hwy 58	Geneva St	2,624	8	2,632	0.0%	-	2,632	3%	2,711	2,400	1.10	1.13	F	F
	Geneva St	QEW	1,007	89	1,096	0.0%	-	1,096	3%	1,128	2,400	0.46	0.47	A	A
RHC Expressway	QEW	Barton	2,926	64	2,990	0.0%	-	2,990	3%	3,079	2,400	1.25	1.28	F	F
	Barton	Queensway	2,869	99	2,967	0.0%	-	2,967	3%	3,056	2,400	1.24	1.27	F	F
	Queensway	King	3,276	99	3,375	0.0%	-	3,375	3%	3,476	2,400	1.41	1.45	F	F
	King	Mud St	3,815	99	3,914	0.0%	-	3,914	3%	4,031	2,400	1.63	1.68	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network
High Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M. Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,751	241	1,991	0.0%	-	1,991	25%	2,489	3,600	0.55	0.69	B	C
	Hwy 420	Hwy 405	3,306	251	3,557	0.0%	-	3,557	25%	4,447	5,400	0.66	0.82	C	D
	Hwy 405	RR 55	4,563	437	5,000	0.0%	-	5,000	38%	6,900	5,400	0.93	1.28	E	F
	RR 55	Ontario Street	4,563	437	5,000	0.0%	-	5,000	38%	6,900	4,500	1.11	1.53	F	F
	Ontario Street	Hwy 406	4,183	392	4,574	0.0%	-	4,574	38%	6,312	5,400	0.85	1.17	D	F
	Hwy 406	Fruitland	4,925	483	5,407	0.0%	-	5,407	25%	6,759	5,400	1.00	1.25	F	F
	Fruitland	Hwy 20	4,576	536	5,111	0.0%	-	5,111	3%	5,265	5,400	0.95	0.97	E	E
	Hwy 20	Hwy 403	6,410	551	6,961	0.0%	-	6,961	3%	7,169	6,000	1.16	1.19	F	F
Hwy 403	Brantford	Hwy 2	1,270	-	1,270	15.0%	190	1,460	3%	1,504	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,912	84	2,996	15.0%	437	3,433	3%	3,536	3,600	0.95	0.98	E	E
	RHC Express.	Aberdeen	3,784	28	3,813	15.0%	568	4,380	3%	4,512	3,600	1.22	1.25	F	F
	Aberdeen	Hwy 6	6,933	67	7,000	0.0%	-	7,000	3%	7,210	6,000	1.17	1.20	F	F
	Hwy 6	QEW	7,083	91	7,173	0.0%	-	7,173	3%	7,389	5,400	1.33	1.37	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,498	-	1,498	6.5%	97	1,595	3%	1,643	1,600	1.00	1.03	E	F
	Rymal Rd	RHC Express.	1,217	-	1,217	6.5%	79	1,296	3%	1,335	1,600	0.81	0.83	D	D
	RHC Express.	Claremont	1,533	-	1,533	6.5%	100	1,633	3%	1,682	2,000	0.82	0.84	D	D
Hwy 53	Hwy 2	Fiddlers Green	263	-	263	12.0%	32	295	3%	304	2,400	0.12	0.13	A	A
	Fiddlers Green	Hwy 6	614	0	614	12.0%	74	688	3%	708	1,200	0.57	0.59	B	B
	Hwy 6	Hwy 56	1,097	-	1,097	12.0%	132	1,229	3%	1,266	2,400	0.51	0.53	B	B
Hwy 20	QEW	Queenston	2,157	138	2,295	0.0%	-	2,295	25%	2,869	1,600	1.43	1.79	F	F
	Queenston	Mud St	2,280	-	2,280	0.0%	-	2,280	25%	2,850	1,600	1.43	1.78	F	F
	Mud St	Hwy 53	1,324	13	1,336	0.0%	-	1,336	25%	1,671	2,400	0.56	0.70	B	C
	Hwy 53	RR 27	804	13	817	7.0%	56	873	25%	1,091	2,400	0.36	0.45	A	A
	RR 27	Fonthill	524	30	554	7.0%	37	591	25%	739	900	0.66	0.82	C	D
	Fonthill	Hwy 406	1,352	3	1,354	7.0%	95	1,449	25%	1,811	1,800	0.80	1.01	D	F
	Hwy 406	Hwy 58	971	7	978	7.0%	68	1,046	25%	1,307	900	1.16	1.45	F	F
	Hwy 58	Montrose Rd	1,520	-	1,520	7.0%	106	1,626	25%	2,033	1,600	1.02	1.27	F	F
Hwy 405	QEW	Q-L Bridge	1,648	198	1,847	0.0%	-	1,847	38%	2,548	3,600	0.51	0.71	B	C
Hwy 420	QEW	Stanley Ave	2,202	30	2,232	0.0%	-	2,232	25%	2,790	3,600	0.62	0.77	B	C
Hwy 58	Hwy 406	Hwy 3	439	-	439	0.0%	-	439	3%	453	900	0.49	0.50	A	B
Hwy 140	Welland	Hwy 3	430	-	430	7.0%	30	460	3%	474	800	0.58	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	689	-	689	4.5%	31	720	3%	741	1,800	0.40	0.41	A	A
	Hwy140	Hwy 58	204	-	204	4.5%	9	214	3%	220	900	0.24	0.24	A	A
	Hwy 58	Wainfleet	94	-	94	4.5%	4	98	3%	101	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,284	0	1,285	0.0%	-	1,285	3%	1,323	2,400	0.54	0.55	B	B
	Hwy 20	Hwy 58	2,069	1	2,069	0.0%	-	2,069	3%	2,132	2,400	0.86	0.89	D	D
	Hwy 58	Geneva St	2,599	9	2,608	0.0%	-	2,608	3%	2,687	2,400	1.09	1.12	F	F
	Geneva St	QEW	994	90	1,084	0.0%	-	1,084	3%	1,117	2,400	0.45	0.47	A	A
RHC Expressway	QEW	Barton	3,241	8	3,248	0.0%	-	3,248	3%	3,346	2,400	1.35	1.39	F	F
	Barton	Queensway	3,182	28	3,211	0.0%	-	3,211	3%	3,307	2,400	1.34	1.38	F	F
	Queensway	King	3,501	28	3,529	0.0%	-	3,529	3%	3,635	2,400	1.47	1.51	F	F
	King	Mud St	3,961	28	3,990	0.0%	-	3,990	3%	4,109	2,400	1.66	1.71	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Base Network
Low Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,791	319	2,110	0.0%	-	2,110	25%	2,638	3,600	0.59	0.73	B	C
	Hwy 420	Hwy 405	3,174	314	3,488	0.0%	-	3,488	25%	4,360	5,400	0.65	0.81	B	D
	Hwy 405	RR 55	3,979	543	4,521	0.0%	-	4,521	38%	6,240	5,400	0.84	1.16	D	F
	RR 55	Ontario Street	3,979	543	4,521	0.0%	-	4,521	38%	6,240	4,500	1.00	1.39	F	F
	Ontario Street	Hwy 406	3,963	485	4,448	0.0%	-	4,448	38%	6,139	5,400	0.82	1.14	D	F
	Hwy 406	Fruitland	4,546	597	5,143	0.0%	-	5,143	25%	6,429	5,400	0.95	1.19	E	F
	Fruitland	Hwy 20	4,267	654	4,921	0.0%	-	4,921	3%	5,069	5,400	0.91	0.94	E	E
	Hwy 20	Hwy 403	5,497	637	6,135	0.0%	-	6,135	3%	6,319	6,000	1.02	1.05	F	F
Hwy 403	Brantford	Hwy 2	1,155	-	1,155	15.0%	173	1,329	3%	1,368	2,400	0.55	0.57	B	B
	Hwy 2	RHC Express.	2,645	121	2,766	15.0%	397	3,163	3%	3,257	3,600	0.88	0.90	D	E
	RHC Express.	Aberdeen	3,277	121	3,399	15.0%	492	3,890	3%	4,007	3,600	1.08	1.11	F	F
	Aberdeen	Hwy 6	7,182	106	7,289	0.0%	-	7,289	3%	7,507	6,000	1.21	1.25	F	F
	Hwy 6	QEW	7,418	55	7,472	0.0%	-	7,472	3%	7,696	5,400	1.38	1.43	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,633	-	1,633	6.5%	106	1,739	3%	1,792	1,600	1.09	1.12	F	F
	Rymal Rd	RHC Express.	1,226	-	1,226	6.5%	80	1,306	3%	1,345	1,600	0.82	0.84	D	D
	RHC Express.	Claremont	1,590	-	1,590	6.5%	103	1,694	3%	1,745	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	282	-	282	12.0%	34	316	3%	325	2,400	0.13	0.14	A	A
	Fiddlers Green	Hwy 6	652	0	652	12.0%	78	731	3%	752	1,200	0.61	0.63	B	B
	Hwy 6	Hwy 56	1,038	-	1,038	12.0%	125	1,163	3%	1,197	2,400	0.48	0.50	A	A
Hwy 20	QEW	Queenston	2,074	165	2,238	0.0%	-	2,238	25%	2,798	1,600	1.40	1.75	F	F
	Queenston	Mud St	2,300	-	2,300	0.0%	-	2,300	25%	2,876	1,600	1.44	1.80	F	F
	Mud St	Hwy 53	1,299	16	1,315	0.0%	-	1,315	25%	1,643	2,400	0.55	0.68	B	C
	Hwy 53	RR 27	786	16	802	7.0%	55	857	25%	1,072	2,400	0.36	0.45	A	A
	RR 27	Fonthill	476	25	501	7.0%	33	534	25%	668	900	0.59	0.74	B	C
	Fonthill	Hwy 406	1,313	6	1,319	7.0%	92	1,411	25%	1,764	1,800	0.78	0.98	C	E
	Hwy 406	Hwy 58	958	8	965	7.0%	67	1,032	25%	1,291	900	1.15	1.43	F	F
	Hwy 58	Montrose Rd	1,459	-	1,459	7.0%	102	1,561	25%	1,951	1,600	0.98	1.22	E	F
Hwy 405	QEW	Q-L Bridge	1,232	245	1,477	0.0%	-	1,477	38%	2,039	3,600	0.41	0.57	A	B
Hwy 420	QEW	Stanley Ave	2,084	37	2,120	0.0%	-	2,120	25%	2,650	3,600	0.59	0.74	B	C
Hwy 58	Hwy 406	Hwy 3	610	0	611	0.0%	-	611	3%	629	900	0.68	0.70	C	C
Hwy 140	Welland	Hwy 3	429	-	429	7.0%	30	459	3%	473	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	570	-	570	4.5%	26	595	3%	613	1,800	0.33	0.34	A	A
	Hwy140	Hwy 58	239	-	239	4.5%	11	250	3%	258	900	0.28	0.29	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,124	0	1,124	0.0%	-	1,124	3%	1,158	2,400	0.47	0.48	A	A
	Hwy 20	Hwy 58	2,011	0	2,011	0.0%	-	2,011	3%	2,072	2,400	0.84	0.86	D	D
	Hwy 58	Geneva St	2,603	9	2,611	0.0%	-	2,611	3%	2,690	2,400	1.09	1.12	F	F
	Geneva St	QEW	1,022	130	1,152	0.0%	-	1,152	3%	1,186	2,400	0.48	0.49	A	A
RHC Expressway	QEW	Barton	3,042	83	3,124	0.0%	-	3,124	3%	3,218	2,400	1.30	1.34	F	F
	Barton	Queensway	2,881	121	3,002	0.0%	-	3,002	3%	3,092	2,400	1.25	1.29	F	F
	Queensway	King	3,254	121	3,376	0.0%	-	3,376	3%	3,477	2,400	1.41	1.45	F	F
	King	Mud St	3,851	121	3,972	0.0%	-	3,972	3%	4,091	2,400	1.66	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Base Network
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,767	267	2,034	0.0%	-	2,034	25%	2,542	3,600	0.56	0.71	B	C
	Hwy 420	Hwy 405	3,294	293	3,587	0.0%	-	3,587	25%	4,484	5,400	0.66	0.83	C	D
	Hwy 405	RR 55	4,210	546	4,756	0.0%	-	4,756	38%	6,563	5,400	0.88	1.22	D	F
	RR 55	Ontario Street	4,210	546	4,756	0.0%	-	4,756	38%	6,563	4,500	1.06	1.46	F	F
	Ontario Street	Hwy 406	4,198	490	4,688	0.0%	-	4,688	38%	6,469	5,400	0.87	1.20	D	F
	Hwy 406	Fruitland	4,823	602	5,425	0.0%	-	5,425	25%	6,781	5,400	1.00	1.26	F	F
	Fruitland	Hwy 20	4,511	661	5,172	0.0%	-	5,172	3%	5,327	5,400	0.96	0.99	E	E
	Hwy 20	Hwy 403	5,609	635	6,244	0.0%	-	6,244	3%	6,431	6,000	1.04	1.07	F	F
Hwy 403	Brantford	Hwy 2	1,129	-	1,129	15.0%	169	1,298	3%	1,337	2,400	0.54	0.56	B	B
	Hwy 2	RHC Express.	2,566	125	2,691	15.0%	385	3,076	3%	3,168	3,600	0.85	0.88	D	D
	RHC Express.	Aberdeen	3,296	124	3,420	15.0%	494	3,915	3%	4,032	3,600	1.09	1.12	F	F
	Aberdeen	Hwy 6	7,261	105	7,366	0.0%	-	7,366	3%	7,587	6,000	1.23	1.26	F	F
	Hwy 6	QEW	7,467	40	7,507	0.0%	-	7,507	3%	7,732	5,400	1.39	1.43	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,646	-	1,646	6.5%	107	1,753	3%	1,805	1,600	1.10	1.13	F	F
	Rymal Rd	RHC Express.	1,238	-	1,238	6.5%	80	1,319	3%	1,358	1,600	0.82	0.85	D	D
	RHC Express.	Claremont	1,591	-	1,591	6.5%	103	1,695	3%	1,746	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	273	-	273	12.0%	33	306	3%	316	2,400	0.13	0.13	A	A
	Fiddlers Green	Hwy 6	686	1	686	12.0%	82	769	3%	792	1,200	0.64	0.66	B	C
	Hwy 6	Hwy 56	1,121	3	1,125	12.0%	135	1,259	3%	1,297	2,400	0.52	0.54	B	B
Hwy 20	QEW	Queenston	2,147	169	2,317	0.0%	-	2,317	25%	2,896	1,600	1.45	1.81	F	F
	Queenston	Mud St	2,334	-	2,334	0.0%	-	2,334	25%	2,918	1,600	1.46	1.82	F	F
	Mud St	Hwy 53	1,344	11	1,355	0.0%	-	1,355	25%	1,694	2,400	0.56	0.71	B	C
	Hwy 53	RR 27	946	12	958	7.0%	66	1,024	25%	1,281	2,400	0.43	0.53	A	B
	RR 27	Fonthill	633	25	658	7.0%	44	702	25%	878	900	0.78	0.98	C	E
	Fonthill	Hwy 406	1,452	1	1,453	7.0%	102	1,555	25%	1,943	1,800	0.86	1.08	D	F
	Hwy 406	Hwy 58	1,032	3	1,035	7.0%	72	1,108	25%	1,384	900	1.23	1.54	F	F
	Hwy 58	Montrose Rd	1,487	-	1,487	7.0%	104	1,591	25%	1,989	1,600	0.99	1.24	E	F
Hwy 405	QEW	Q-L Bridge	1,738	273	2,011	0.0%	-	2,011	38%	2,775	3,600	0.56	0.77	B	C
Hwy 420	QEW	Stanley Ave	2,236	40	2,276	0.0%	-	2,276	25%	2,845	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	579	-	579	0.0%	-	579	3%	596	900	0.64	0.66	B	C
Hwy 140	Welland	Hwy 3	412	12	423	7.0%	29	452	3%	466	800	0.57	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	744	9	752	4.5%	33	786	3%	809	1,800	0.44	0.45	A	A
	Hwy140	Hwy 58	330	26	356	4.5%	15	371	3%	382	900	0.41	0.42	A	A
	Hwy 58	Wainfleet	102	-	102	4.5%	5	107	3%	110	900	0.12	0.12	A	A
	Wainfleet	West Gateway	-	25	25	4.5%	-	25	3%	26	900	0.03	0.03	A	A
Hwy 406	East Main Street	Hwy 20	1,188	0	1,188	0.0%	-	1,188	3%	1,224	2,400	0.49	0.51	A	B
	Hwy 20	Hwy 58	2,154	1	2,155	0.0%	-	2,155	3%	2,220	2,400	0.90	0.92	D	E
	Hwy 58	Geneva St	2,660	10	2,670	0.0%	-	2,670	3%	2,750	2,400	1.11	1.15	F	F
	Geneva St	QEW	988	107	1,095	0.0%	-	1,095	3%	1,128	2,400	0.46	0.47	A	A
RHC Expressway	QEW	Barton	2,865	102	2,967	0.0%	-	2,967	3%	3,056	2,400	1.24	1.27	F	F
	Barton	Queensway	2,822	124	2,947	0.0%	-	2,947	3%	3,035	2,400	1.23	1.26	F	F
	Queensway	King	3,216	124	3,341	0.0%	-	3,341	3%	3,441	2,400	1.39	1.43	F	F
	King	Mud St	3,806	124	3,931	0.0%	-	3,931	3%	4,049	2,400	1.64	1.69	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,721	262	1,983	0.0%	-	1,983	25%	2,479	3,600	0.55	0.69	B	C
	Hwy 420	Hwy 405	3,266	311	3,576	0.0%	-	3,576	25%	4,470	5,400	0.66	0.83	C	D
	Hwy 405	RR 55	4,536	535	5,071	0.0%	-	5,071	38%	6,999	5,400	0.94	1.30	E	F
	RR 55	Ontario Street	4,536	535	5,071	0.0%	-	5,071	38%	6,999	4,500	1.13	1.56	F	F
	Ontario Street	Hwy 406	4,231	489	4,720	0.0%	-	4,720	38%	6,514	5,400	0.87	1.21	D	F
	Hwy 406	Fruitland	4,855	601	5,456	0.0%	-	5,456	25%	6,820	5,400	1.01	1.26	F	F
	Fruitland	Hwy 20	4,517	654	5,170	0.0%	-	5,170	3%	5,326	5,400	0.96	0.99	E	E
	Hwy 20	Hwy 403	6,371	652	7,023	0.0%	-	7,023	3%	7,233	6,000	1.17	1.21	F	F
Hwy 403	Brantford	Hwy 2	1,248	-	1,248	15.0%	187	1,435	3%	1,479	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,958	108	3,066	15.0%	444	3,509	3%	3,615	3,600	0.97	1.00	E	F
	RHC Express.	Aberdeen	3,817	36	3,852	15.0%	573	4,425	3%	4,558	3,600	1.23	1.27	F	F
	Aberdeen	Hwy 6	7,090	91	7,181	0.0%	-	7,181	3%	7,396	6,000	1.20	1.23	F	F
	Hwy 6	QEW	7,151	120	7,271	0.0%	-	7,271	3%	7,490	5,400	1.35	1.39	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,545	-	1,545	6.5%	100	1,645	3%	1,695	1,600	1.03	1.06	F	F
	Rymal Rd	RHC Express.	1,262	-	1,262	6.5%	82	1,344	3%	1,385	1,600	0.84	0.87	D	D
	RHC Express.	Claremont	1,582	-	1,582	6.5%	103	1,685	3%	1,735	2,000	0.84	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	306	-	306	12.0%	37	343	3%	353	2,400	0.14	0.15	A	A
	Fiddlers Green	Hwy 6	714	1	714	12.0%	86	800	3%	824	1,200	0.67	0.69	C	C
	Hwy 6	Hwy 56	1,131	7	1,138	12.0%	136	1,273	3%	1,312	2,400	0.53	0.55	B	B
Hwy 20	QEW	Queenston	2,178	161	2,339	0.0%	-	2,339	25%	2,924	1,600	1.46	1.83	F	F
	Queenston	Mud St	2,332	-	2,332	0.0%	-	2,332	25%	2,915	1,600	1.46	1.82	F	F
	Mud St	Hwy 53	1,403	11	1,415	0.0%	-	1,415	25%	1,769	2,400	0.59	0.74	B	C
	Hwy 53	RR 27	890	12	902	7.0%	62	964	25%	1,205	2,400	0.40	0.50	A	B
	RR 27	Fonthill	644	23	667	7.0%	45	712	25%	890	900	0.79	0.99	C	E
	Fonthill	Hwy 406	1,438	1	1,440	7.0%	101	1,540	25%	1,925	1,800	0.86	1.07	D	F
	Hwy 406	Hwy 58	1,018	10	1,028	7.0%	71	1,100	25%	1,375	900	1.22	1.53	F	F
	Hwy 58	Montrose Rd	1,550	-	1,550	7.0%	108	1,658	25%	2,072	1,600	1.04	1.30	F	F
Hwy 405	QEW	Q-L Bridge	1,749	272	2,021	0.0%	-	2,021	38%	2,789	3,600	0.56	0.77	B	C
Hwy 420	QEW	Stanley Ave	2,240	39	2,279	0.0%	-	2,279	25%	2,849	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	421	-	421	0.0%	-	421	3%	433	900	0.47	0.48	A	A
Hwy 140	Welland	Hwy 3	453	-	453	7.0%	32	484	3%	499	800	0.61	0.62	B	B
Hwy 3	Fort Erie	Hwy 140	746	-	746	4.5%	34	780	3%	803	1,800	0.43	0.45	A	A
	Hwy140	Hwy 58	286	26	311	4.5%	13	324	3%	334	900	0.36	0.37	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	-	22	22	4.5%	-	22	3%	22	900	0.02	0.02	A	A
Hwy 406	East Main Street	Hwy 20	1,342	0	1,342	0.0%	-	1,342	3%	1,383	2,400	0.56	0.58	B	B
	Hwy 20	Hwy 58	2,138	5	2,142	0.0%	-	2,142	3%	2,207	2,400	0.89	0.92	D	E
	Hwy 58	Geneva St	2,591	20	2,611	0.0%	-	2,611	3%	2,689	2,400	1.09	1.12	F	F
	Geneva St	QEW	979	107	1,087	0.0%	-	1,087	3%	1,119	2,400	0.45	0.47	A	A
RHC Expressway	QEW	Barton	3,267	4	3,270	0.0%	-	3,270	3%	3,368	2,400	1.36	1.40	F	F
	Barton	Queensway	3,168	36	3,204	0.0%	-	3,204	3%	3,300	2,400	1.33	1.37	F	F
	Queensway	King	3,573	36	3,608	0.0%	-	3,608	3%	3,717	2,400	1.50	1.55	F	F
	King	Mud St	3,974	36	4,010	0.0%	-	4,010	3%	4,130	2,400	1.67	1.72	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

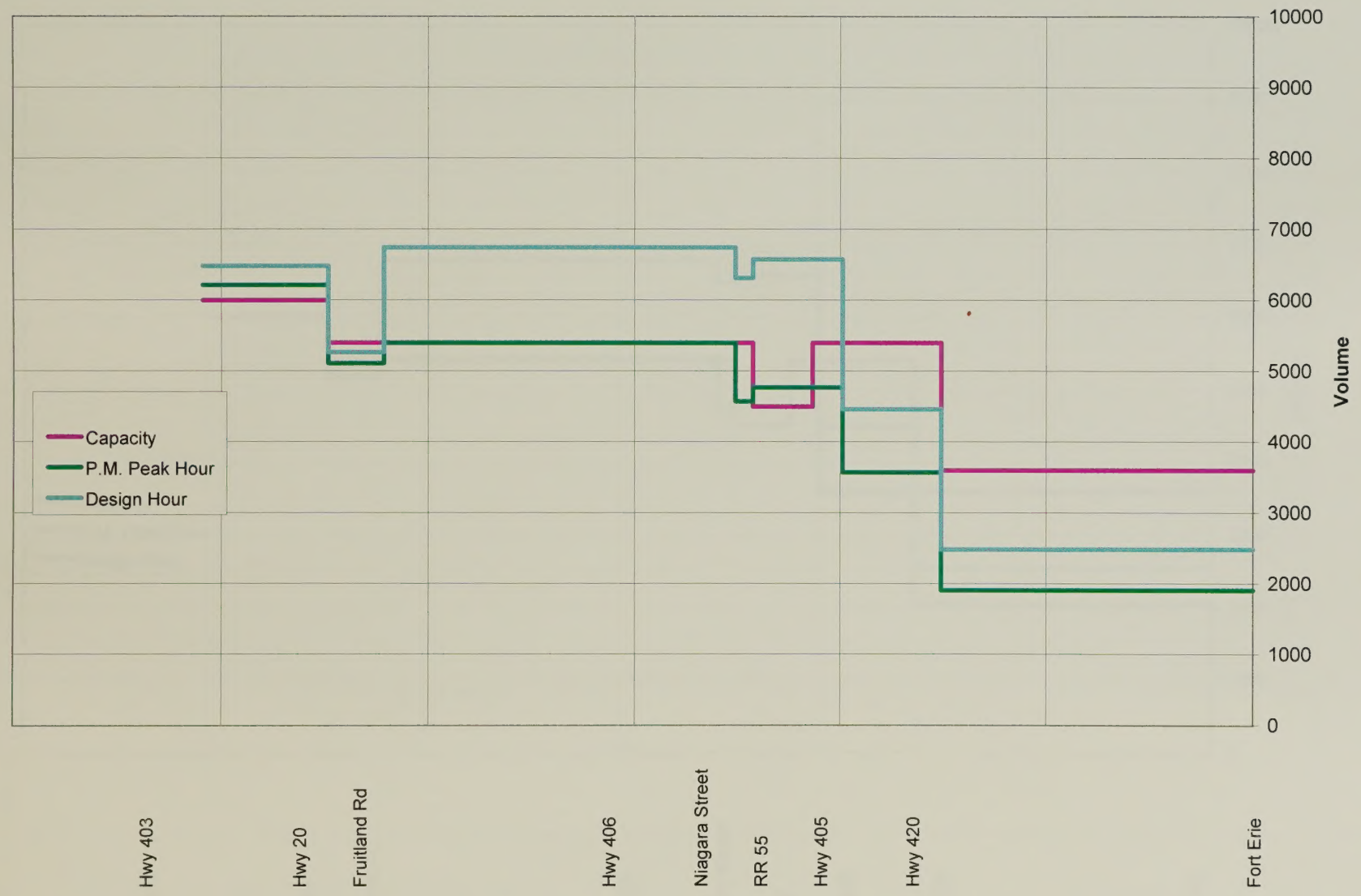
APPENDIX J
BASE NETWORK - VOLUME TO CAPACITY PLOTS

Year 2000 - Existing Network - Design Hour - Volume to Capacity

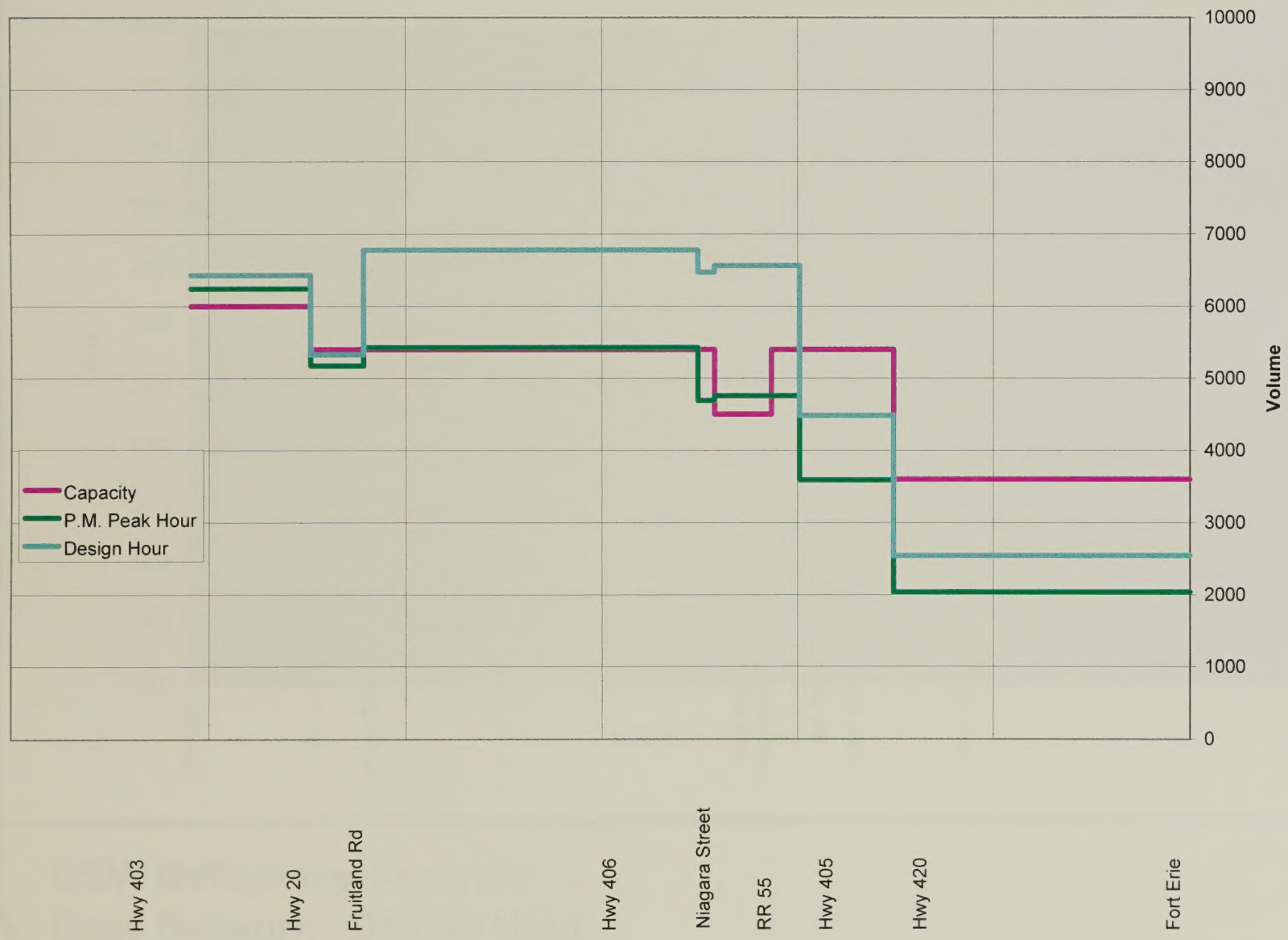
Year 2031 - Base Network
Design Hour - Volume to Capacity

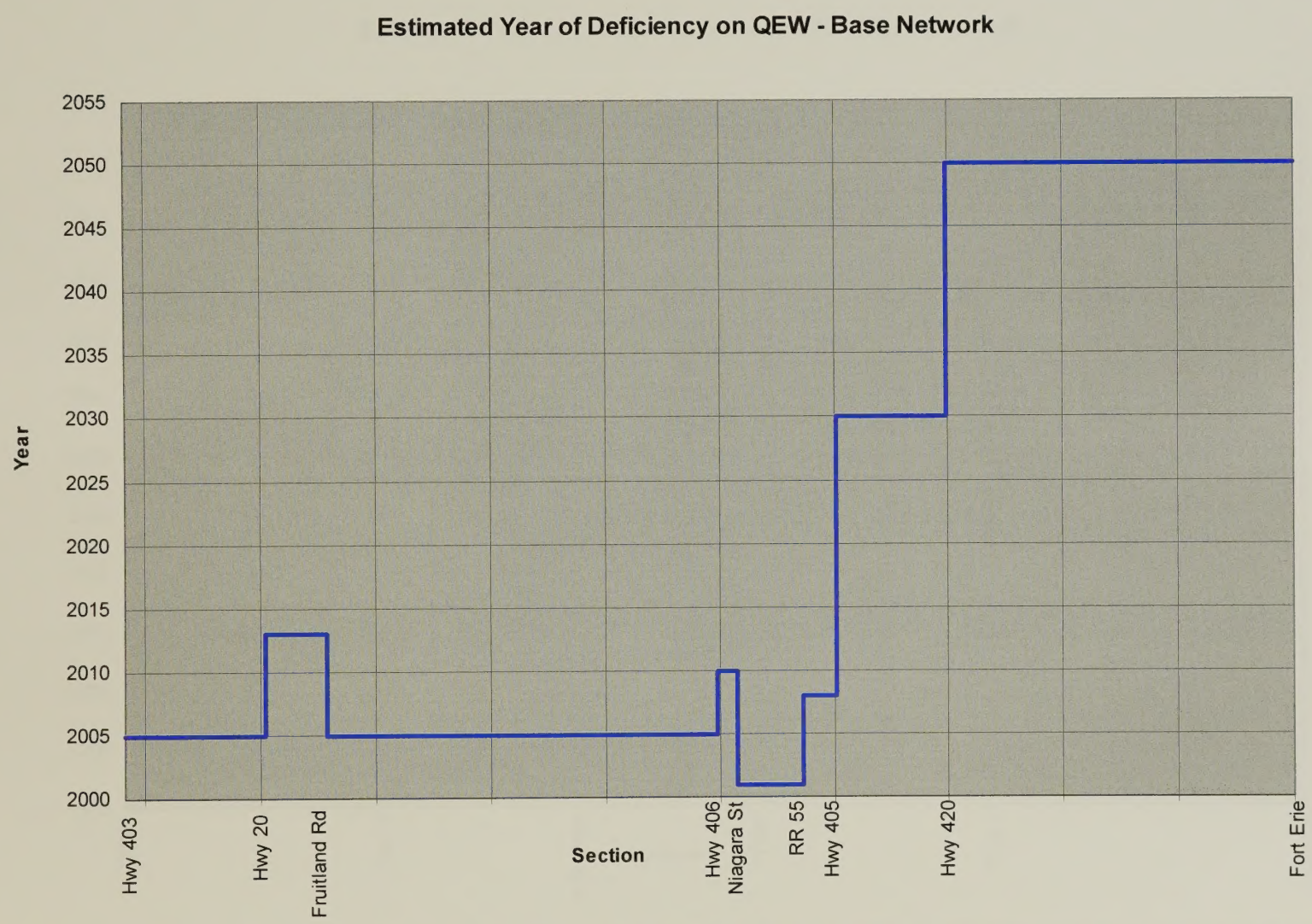
APPENDIX J
QEW/HIGHWAY 403 DEFICIENCY ANALYSIS

6 Lane QEW- Year 2021 Volumes

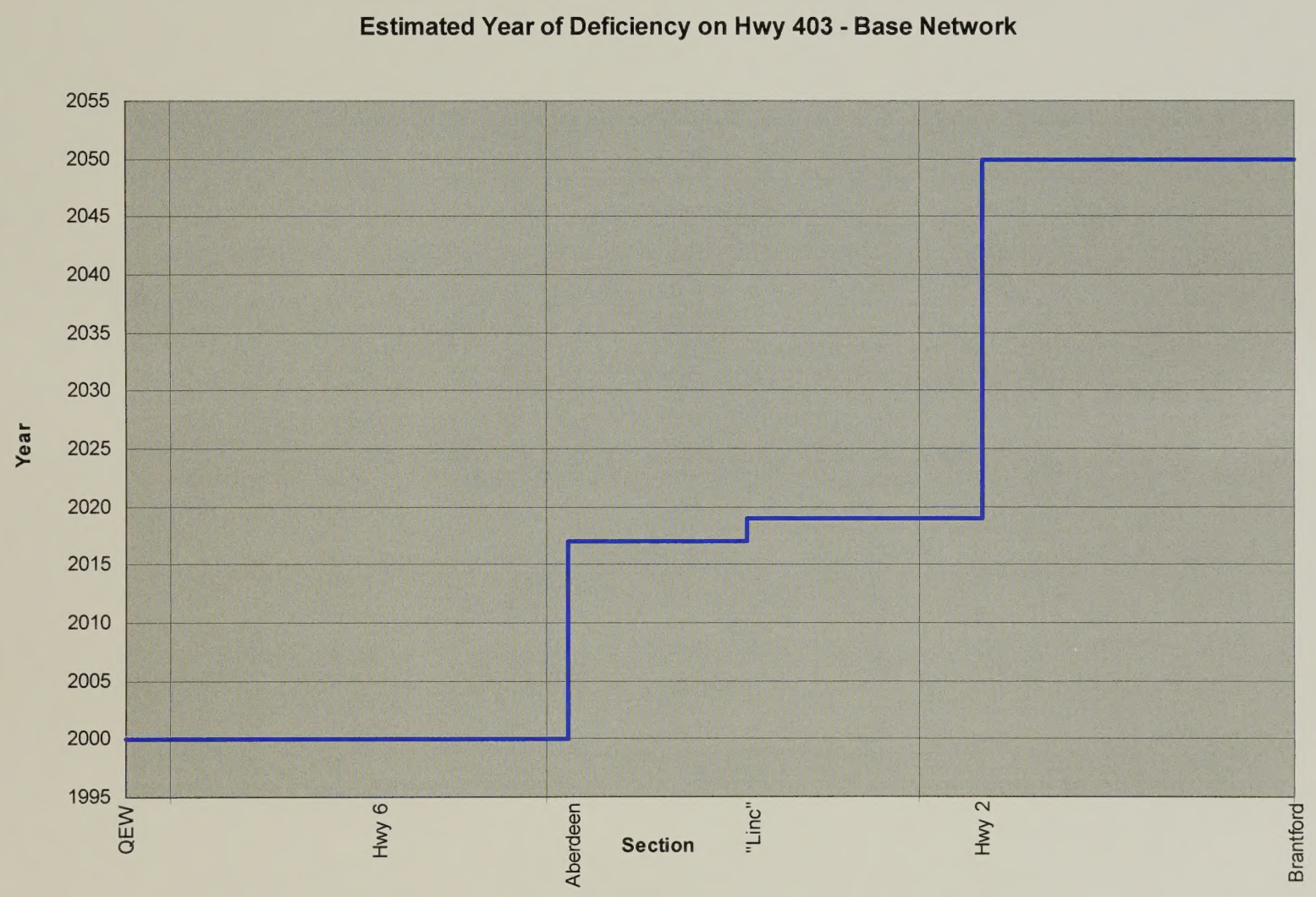


6 Lane QEW- Year 2031 Volume





QEW Deficiency Analysis
Base Network - Design Hour



Hwy 403 Deficiency Analysis
Base Network - Design Hour

APPENDIX K

Network Analysis

Appendix K
Alternative Networks

Road Network Alternatives

APPENDIX K
MPC ALTERNATIVES

MPC - Alternative A

MPC - Alternative B1(B2)

MPC - Alternative C

MPC - Alternative D1

MPC - Alternative D2

MPC - Alternative E

APPENDIX K
2021 ALTERNATIVE NETWORK – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2132: Year 2021 pmpkhr HIGH - Revised Base Network

02-07-08 14:49
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2132: Year 2021 pmpkhr HIGH - Revised Base Network

02-07-08 14:49
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2132: Year 2021 pmpkhr HIGH - Revised Base Network

02-07-08 14:49
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2142: Year 2021 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 14:50
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2142: Year 2021 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 14:50
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2142: Year 2021 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 14:51
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2182: Year 2021 pmpkhr HIGH-Revised BAse Network w\MPC Alt.C

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2182: Year 2021 pmpkhr HIGH-Revised BAse Network w\MPC Alt.C

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

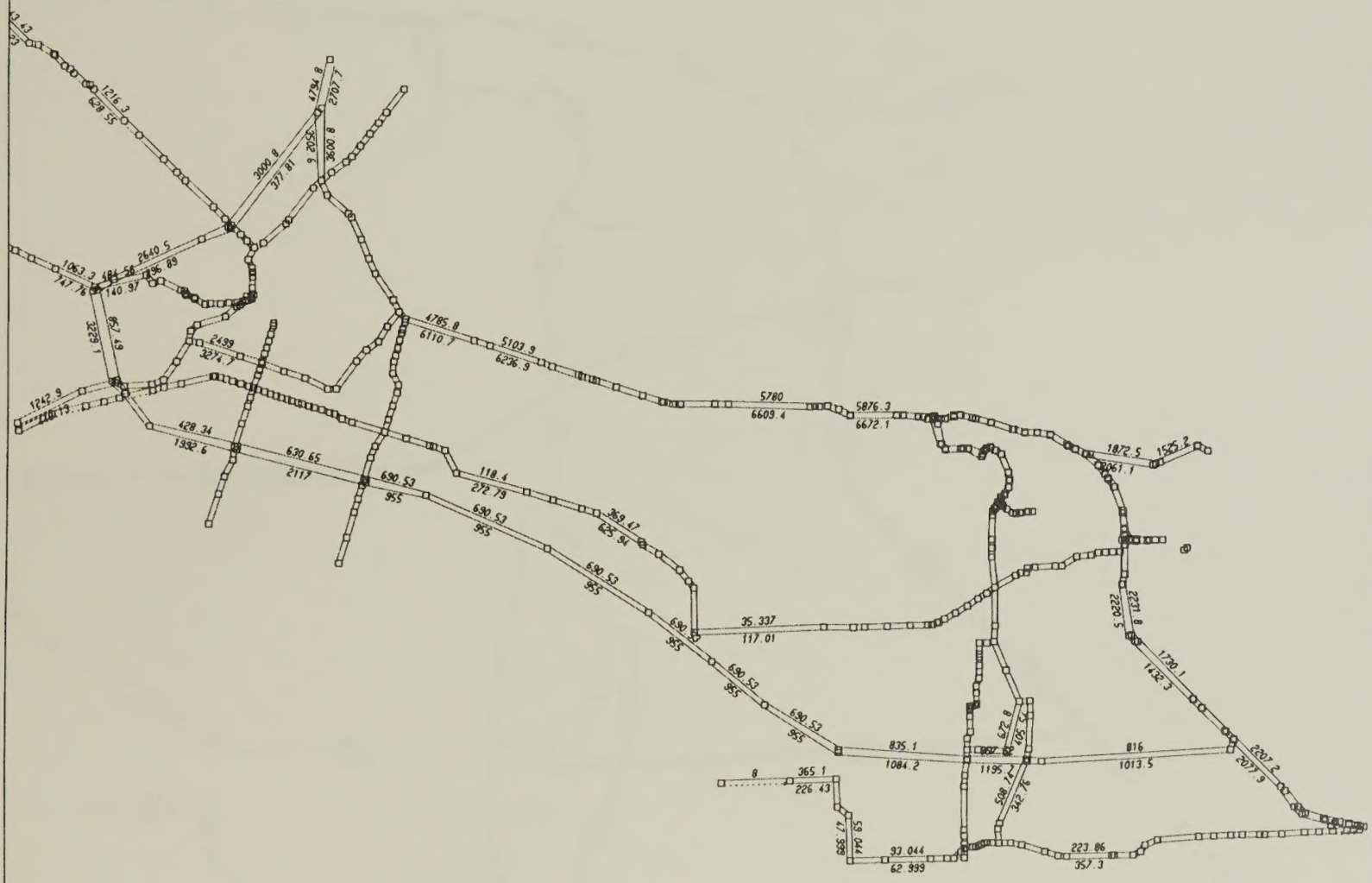
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2182: Year 2021 pmpkhr HIGH-Revised BAse Network w\MPC Alt.C

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2332: Year 2021 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2332: Year 2021 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2332: Year 2021 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

01-05-09 10:43
MODULE: 2.13
TSH.....dd

APPENDIX K
2031 ALTERNATIVE NETWORK – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

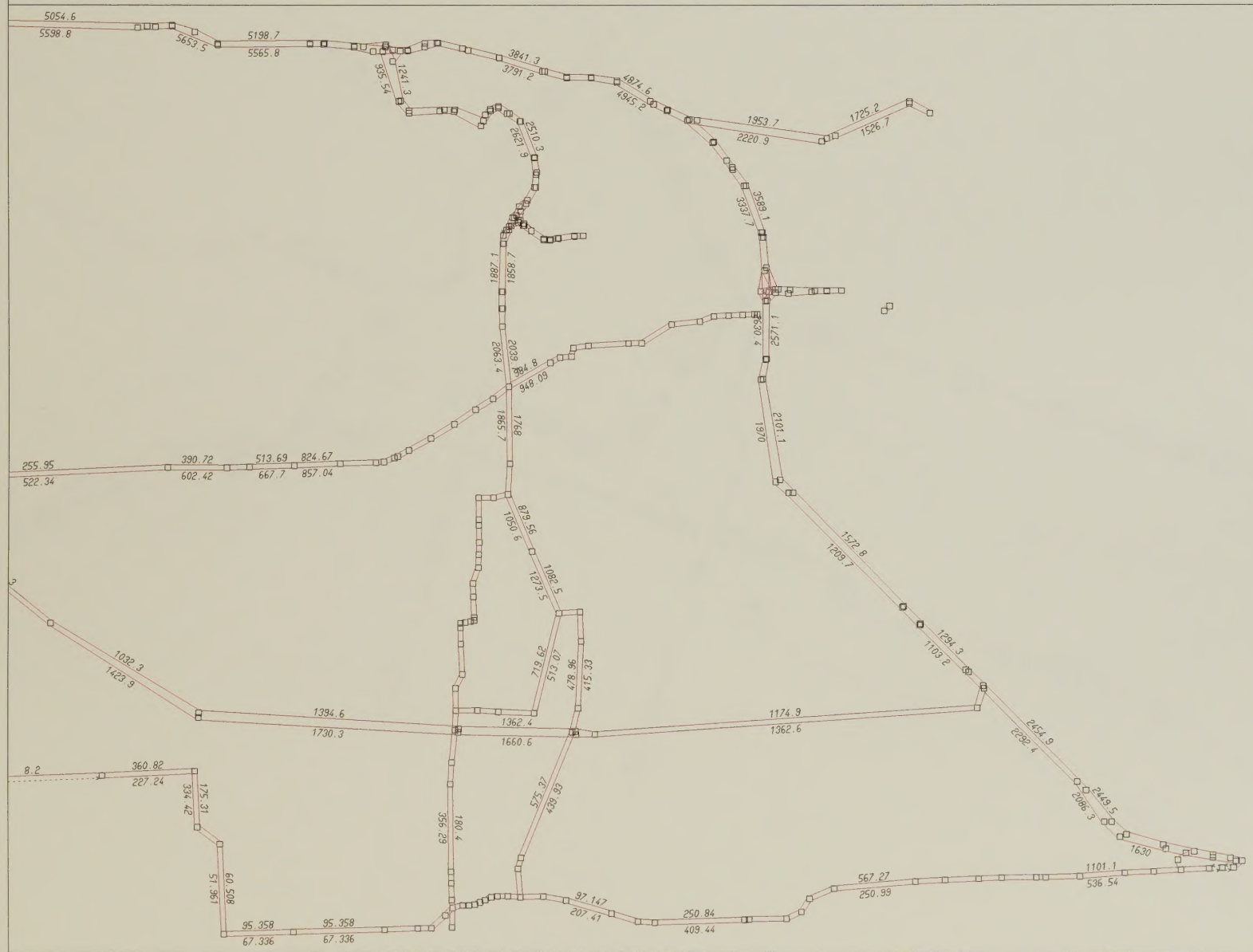
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3162: Year 2031 pmpkhr HIGH-Revised Base NEtwork x\MPC Alt.A

02-07-08 15:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3162: Year 2031 pmpkhr HIGH-Revised Base NEtwork x\MPC Alt.A

02-07-08 15:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3162: Year 2031 pmpkhr HIGH-Revised Base NEtwork x\MPC Alt.A

02-07-08 15:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

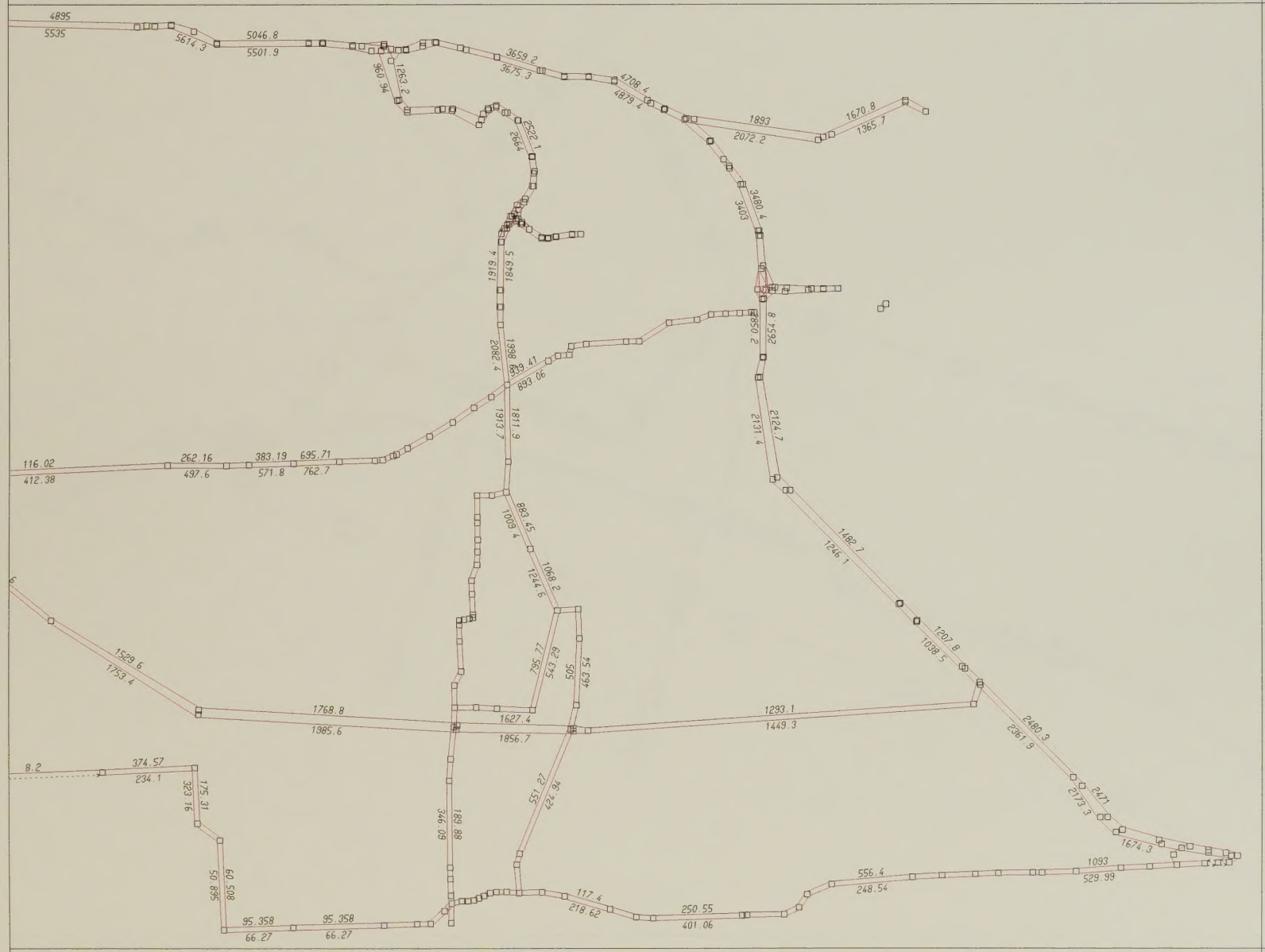
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3172: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.B

02-07-08 15:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3172: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.B

02-07-08 15:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3172: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.B

02-07-08 15:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

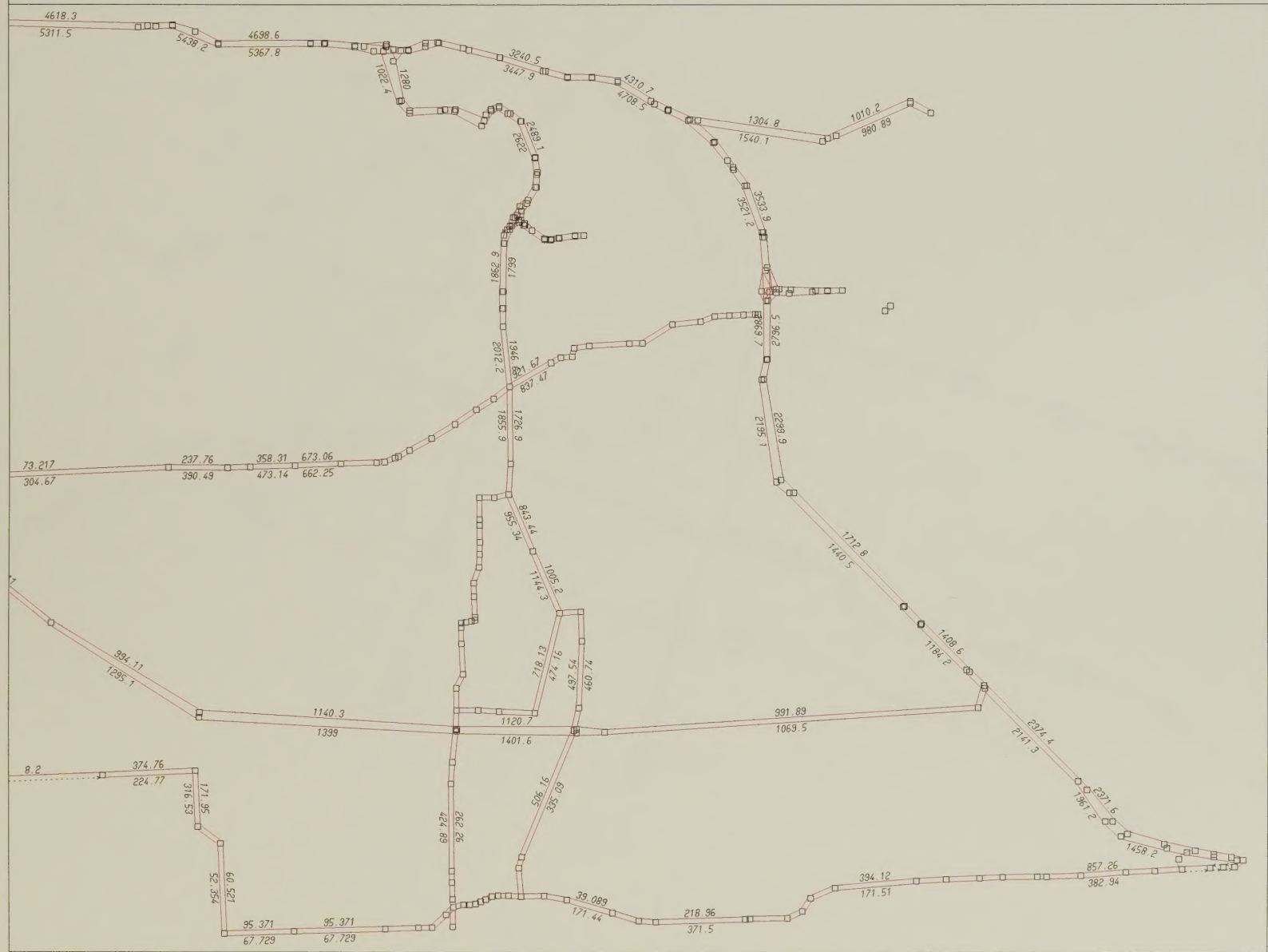
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3181: Year 2031 pmpkhr LOW-Revised Base NEtwork w\MPC Alt.C

02-07-08 15:41
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3181: Year 2031 pmpkhr LOW-Revised Base NEtwork w\MPC Alt.C

02-07-08 15:41
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

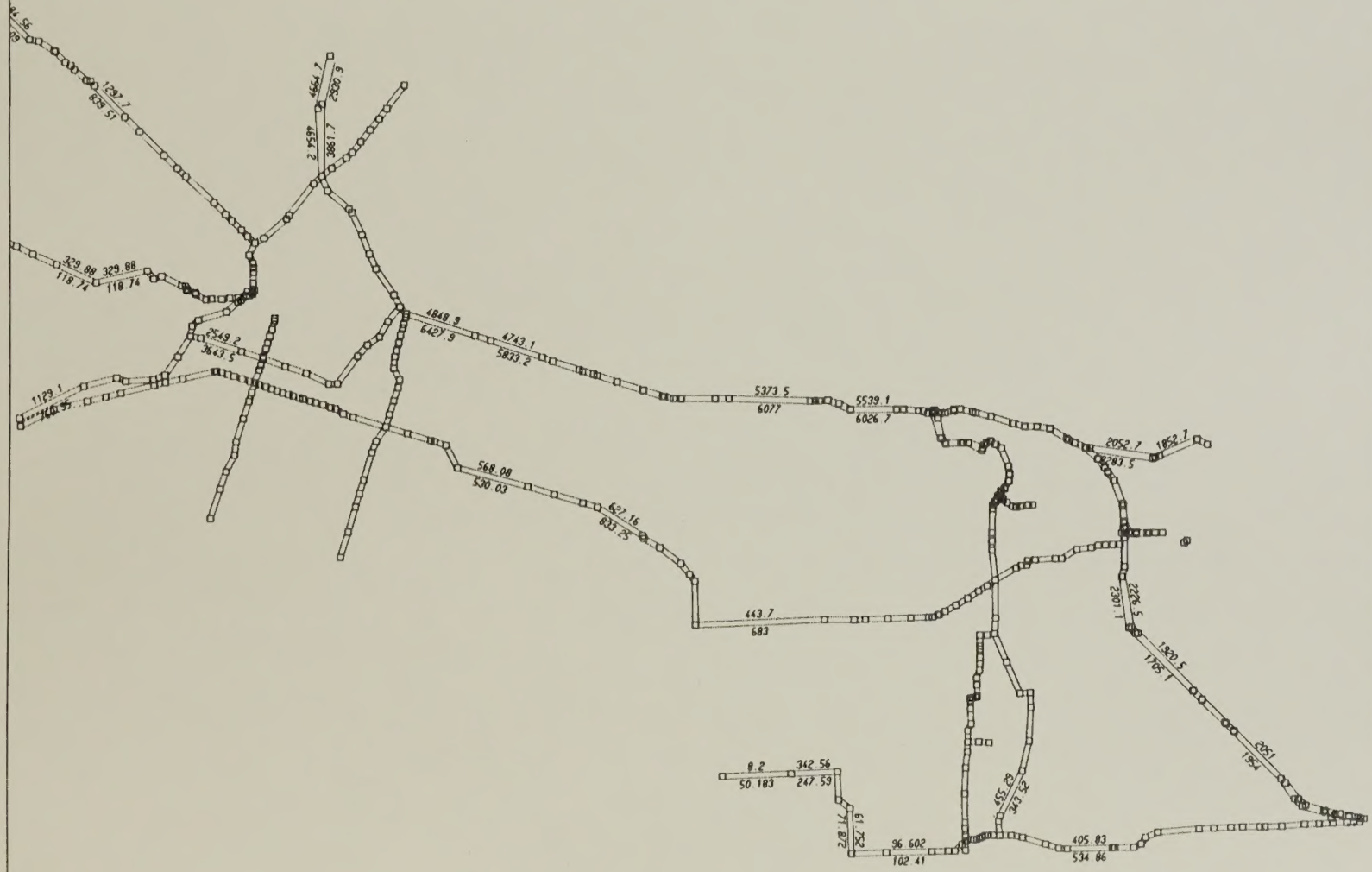
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3181: Year 2031 pmpkhr LOW-Revised Base NEtwork w\MPC Alt.C

02-07-08 15:42
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3112: Year 2031 pmpkhr HIGH - Base Network

01-05-09 10:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3132: Year 2031 pmpkhr HIGH - Revised Base Network

02-07-08 15:43
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3132: Year 2031 pmpkhr HIGH - Revised Base Network

02-07-08 15:44
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3142: Year 2031 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 15:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3142: Year 2031 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 15:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3142: Year 2031 pmpkhr HIGH-Revised Base Network w\8 lane QEW

02-07-08 15:46
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3182: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 15:47
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3182: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 15:47
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3182: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.C

02-07-08 15:47
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3192: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.D

02-07-08 15:48
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3192: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.D

02-07-08 15:48
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3192: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.D

02-07-08 15:48
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3202: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.E

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3202: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.E

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3202: Year 2031 pmpkhr HIGH-Revised Base Network w\MPC Alt.E

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2143: Year 2021 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:50
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2143: Year 2021 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:51
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2143: Year 2021 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:51
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3143: Year 2031 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:58
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

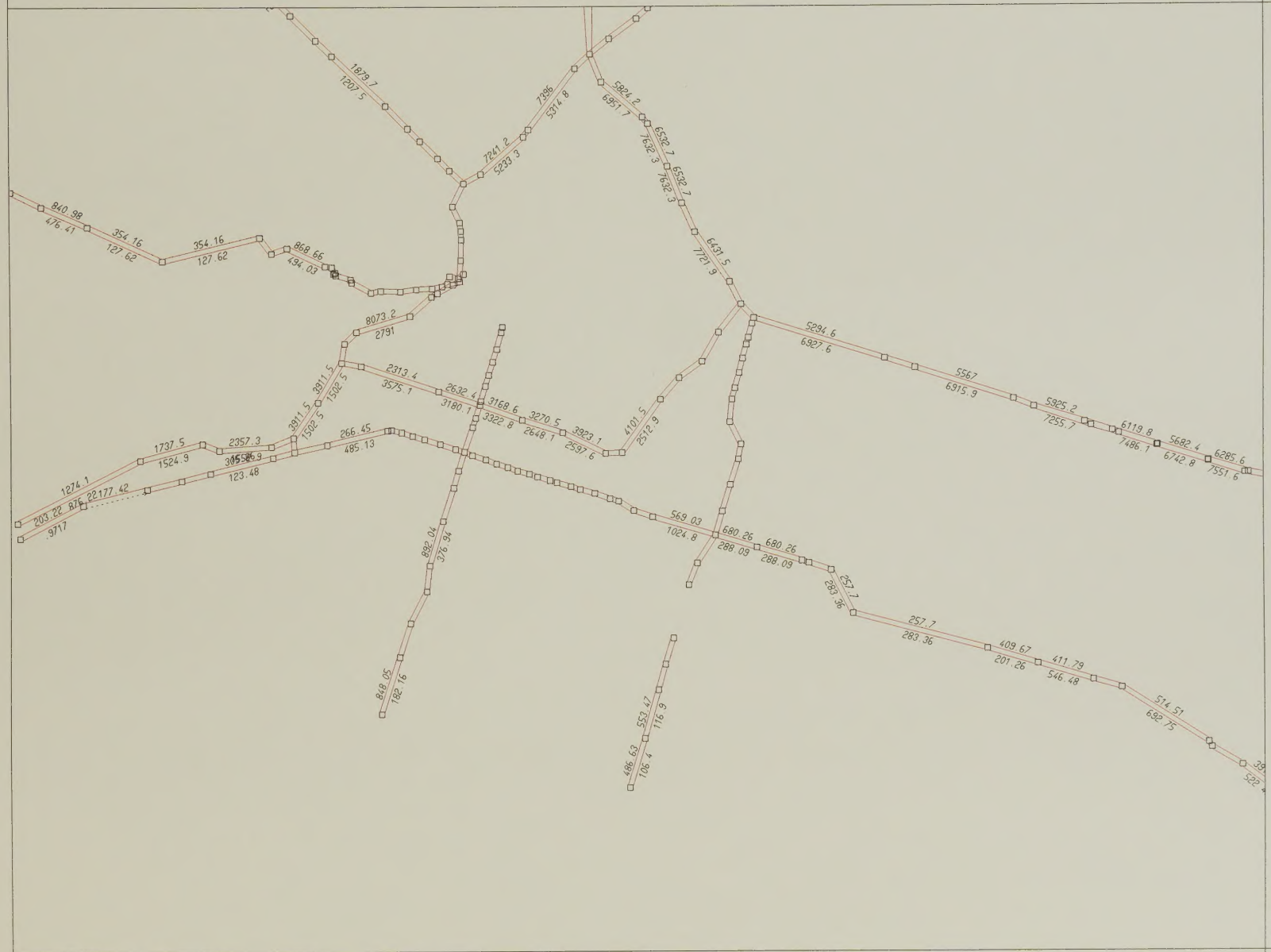
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3143: Year 2031 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:58
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3143: Year 2031 pmpkhr HIGH-Rev Base Net w\8 lane QEW&Hwy 420 ext

02-07-08 15:59
MODULE: 2.13
TSH.....dd

APPENDIX K
2011 ALTERNATIVE NETWORK – LEVEL OF SERVICE

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. C
High Tourist Condition
Year 2011 - Volumes

Facility	Section From	Section To	Base Assignment - Peak Direction Auto	Truck	Total	Adjustment - Local Trucks %	Trucks	Adj Total	Adjustment - Design Hour %	Adj Total	Capacity	Volume/Capacity P.M. Pk Hour	Design Hour	Level of Service P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,636	203	1,839	0.0%	-	1,839	25%	2,299	3,600	0.51	0.64	B	B
	Hwy 420	Hwy 405	2,936	180	3,116	0.0%	-	3,116	25%	3,896	5,400	0.58	0.72	B	C
	Hwy 405	RR 55	3,874	252	4,125	0.0%	-	4,125	38%	5,693	5,400	0.76	1.05	C	F
	RR 55	Ontario Street	3,874	252	4,125	0.0%	-	4,125	38%	5,693	4,500	0.92	1.27	E	F
	Ontario Street	Hwy 406	3,651	211	3,862	0.0%	-	3,862	38%	5,330	5,400	0.72	0.99	C	E
	Hwy 406	Fruitland	4,549	287	4,835	0.0%	-	4,835	25%	6,044	5,400	0.90	1.12	D	F
	Fruitland	Hwy 20	4,164	301	4,465	0.0%	-	4,465	3%	4,599	5,400	0.83	0.85	D	D
	Hwy 20	Hwy 403	5,002	312	5,314	0.0%	-	5,314	3%	5,473	6,000	0.89	0.91	D	E
Hwy 403	Brantford	Hwy 2	1,219	-	1,219	15.0%	183	1,402	3%	1,444	2,400	0.58	0.60	B	B
	Hwy 2	RHC Express.	2,488	37	2,525	15.0%	373	2,898	3%	2,985	3,600	0.81	0.83	D	D
	RHC Express.	Aberdeen	3,193	39	3,232	15.0%	479	3,711	3%	3,822	3,600	1.03	1.06	F	F
	Aberdeen	Hwy 6	5,952	74	6,026	0.0%	-	6,026	3%	6,207	6,000	1.00	1.03	F	F
	Hwy 6	QEW	6,076	81	6,157	0.0%	-	6,157	3%	6,342	5,400	1.14	1.17	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,250	10	1,260	6.5%	81	1,341	3%	1,381	1,600	0.84	0.86	D	D
	Rymal Rd	RHC Express.	1,138	10	1,148	6.5%	74	1,222	3%	1,259	1,600	0.76	0.79	C	C
	RHC Express.	Claremont	1,442	10	1,452	6.5%	94	1,546	3%	1,593	2,000	0.77	0.80	C	C
Hwy 53	Hwy 2	Fiddlers Green	58	-	58	12.0%	7	64	3%	66	2,400	0.03	0.03	A	A
	Fiddlers Green	Hwy 6	372	-	372	12.0%	45	416	3%	429	1,200	0.35	0.36	A	A
	Hwy 6	Hwy 56	820	-	820	12.0%	98	918	3%	946	2,400	0.38	0.39	A	A
Hwy 20	QEW	Queenston	1,824	96	1,920	0.0%	-	1,920	25%	2,400	1,600	1.20	1.50	F	F
	Queenston	Mud St	1,946	14	1,960	0.0%	-	1,960	25%	2,450	1,600	1.23	1.53	F	F
	Mud St	Hwy 53	1,156	57	1,213	0.0%	-	1,213	25%	1,516	2,400	0.51	0.63	B	B
	Hwy 53	RR 27	336	-	336	7.0%	24	359	25%	449	2,400	0.15	0.19	A	A
	RR 27	Fonthill	103	-	103	7.0%	7	110	25%	138	900	0.12	0.15	A	A
	Fonthill	Hwy 406	1,014	-	1,014	7.0%	71	1,085	25%	1,356	1,800	0.60	0.75	B	C
	Hwy 406	Hwy 58	841	-	841	7.0%	59	900	25%	1,125	900	1.00	1.25	F	F
	Hwy 58	Montrose Rd	1,055	-	1,055	7.0%	74	1,129	25%	1,411	1,600	0.71	0.88	C	D
Hwy 405	QEW	Q-L Bridge	1,415	146	1,561	0.0%	-	1,561	38%	2,155	3,600	0.43	0.60	A	B
Hwy 420	QEW	Stanley Ave	1,914	22	1,937	0.0%	-	1,937	25%	2,421	3,600	0.54	0.67	B	C
Hwy 58	Hwy 406	Hwy 3	474	22	496	0.0%	-	496	3%	511	900	0.55	0.57	B	B
Hwy 140	Welland	Hwy 3	412	-	412	7.0%	29	441	3%	454	800	0.55	0.57	B	B
Hwy 3	Fort Erie	Hwy 140	385	-	385	4.5%	17	402	3%	414	1,800	0.22	0.23	A	A
	Hwy140	Hwy 58	175	-	175	4.5%	8	183	3%	188	900	0.20	0.21	A	A
	Hwy 58	Wainfleet	85	-	85	4.5%	4	89	3%	91	900	0.10	0.10	A	A
	Wainfleet	West Gateway	24	-	24	4.5%	1	25	3%	25	900	0.03	0.03	A	A
Hwy 406	East Main Street	Hwy 20	1,017	3	1,020	0.0%	-	1,020	3%	1,050	2,400	0.42	0.44	A	A
	Hwy 20	Hwy 58	1,704	3	1,707	0.0%	-	1,707	3%	1,758	2,400	0.71	0.73	C	C
	Hwy 58	Geneva St	2,455	3	2,458	0.0%	-	2,458	3%	2,532	2,400	1.02	1.05	F	F
	Geneva St	QEW	947	69	1,016	0.0%	-	1,016	3%	1,047	2,400	0.42	0.44	A	A
RHC Expressway	QEW	Barton	2,788	8	2,795	0.0%	-	2,795	3%	2,879	2,400	1.16	1.20	F	F
	Barton	Queensway	2,910	37	2,947	0.0%	-	2,947	3%	3,036	2,400	1.23	1.26	F	F
	Queensway	King	3,228	37	3,265	0.0%	-	3,265	3%	3,363	2,400	1.36	1.40	F	F
	King	Mud St	3,552	37	3,589	0.0%	-	3,589	3%	3,697	2,400	1.50	1.54	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

APPENDIX K
2021 ALTERNATIVE NETWORK – LEVEL OF SERVICE

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. C
Low Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,741	279	2,019	0.0%	-	2,019	25%	2,524	3,600	0.56	0.70	B	C
	Hwy 420	Hwy 405	3,084	232	3,316	0.0%	-	3,316	25%	4,145	5,400	0.61	0.77	B	C
	Hwy 405	RR 55	3,922	321	4,243	0.0%	-	4,243	38%	5,855	5,400	0.79	1.08	C	F
	RR 55	Ontario Street	3,922	321	4,243	0.0%	-	4,243	38%	5,855	4,500	0.94	1.30	E	F
	Ontario Street	Hwy 406	3,854	267	4,121	0.0%	-	4,121	38%	5,687	5,400	0.76	1.05	C	F
	Hwy 406	Fruitland	4,595	357	4,951	0.0%	-	4,951	25%	6,189	5,400	0.92	1.15	E	F
	Fruitland	Hwy 20	4,129	396	4,524	0.0%	-	4,524	3%	4,660	5,400	0.84	0.86	D	D
	Hwy 20	Hwy 403	5,267	415	5,682	0.0%	-	5,682	3%	5,852	6,000	0.95	0.98	E	E
Hwy 403	Brantford	Hwy 2	1,251	-	1,251	15.0%	188	1,438	3%	1,482	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,629	70	2,699	15.0%	394	3,094	3%	3,187	3,600	0.86	0.89	D	D
	RHC Express.	Aberdeen	3,389	70	3,459	15.0%	508	3,967	3%	4,086	3,600	1.10	1.14	F	F
	Aberdeen	Hwy 6	6,431	64	6,495	0.0%	-	6,495	3%	6,690	6,000	1.08	1.11	F	F
	Hwy 6	QEW	6,473	83	6,556	0.0%	-	6,556	3%	6,753	5,400	1.21	1.25	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,398	8	1,407	6.5%	91	1,498	3%	1,543	1,600	0.94	0.96	E	E
	Rymal Rd	RHC Express.	1,124	8	1,132	6.5%	73	1,205	3%	1,241	1,600	0.75	0.78	C	C
	RHC Express.	Claremont	1,525	8	1,533	6.5%	99	1,632	3%	1,681	2,000	0.82	0.84	D	D
Hwy 53	Hwy 2	Fiddlers Green	368	-	368	12.0%	44	412	3%	424	2,400	0.17	0.18	A	A
	Fiddlers Green	Hwy 6	536	-	536	12.0%	64	600	3%	618	1,200	0.50	0.52	B	B
	Hwy 6	Hwy 56	879	-	879	12.0%	105	984	3%	1,014	2,400	0.41	0.42	A	A
Hwy 20	QEW	Queenston	1,921	126	2,047	0.0%	-	2,047	25%	2,558	1,600	1.28	1.60	F	F
	Queenston	Mud St	2,144	14	2,158	0.0%	-	2,158	25%	2,698	1,600	1.35	1.69	F	F
	Mud St	Hwy 53	1,582	44	1,626	0.0%	-	1,626	25%	2,033	2,400	0.68	0.85	C	D
	Hwy 53	RR 27	537	-	537	7.0%	38	574	25%	718	2,400	0.24	0.30	A	A
	RR 27	Fonthill	213	-	213	7.0%	15	228	25%	285	900	0.25	0.32	A	A
	Fonthill	Hwy 406	1,145	-	1,145	7.0%	80	1,225	25%	1,531	1,800	0.68	0.85	C	D
	Hwy 406	Hwy 58	880	-	880	7.0%	62	941	25%	1,176	900	1.05	1.31	F	F
	Hwy 58	Montrose Rd	1,476	-	1,476	7.0%	103	1,579	25%	1,974	1,600	0.99	1.23	E	F
Hwy 405	QEW	Q-L Bridge	1,113	197	1,310	0.0%	-	1,310	38%	1,808	3,600	0.36	0.50	A	B
Hwy 420	QEW	Stanley Ave	2,083	30	2,113	0.0%	-	2,113	25%	2,642	3,600	0.59	0.73	B	C
Hwy 58	Hwy 406	Hwy 3	443	29	472	0.0%	-	472	3%	486	900	0.52	0.54	B	B
Hwy 140	Welland	Hwy 3	418	-	418	7.0%	29	447	3%	461	800	0.56	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	383	-	383	4.5%	17	401	3%	413	1,800	0.22	0.23	A	A
	Hwy140	Hwy 58	165	-	165	4.5%	7	172	3%	177	900	0.19	0.20	A	A
	Hwy 58	Wainfleet	93	-	93	4.5%	4	97	3%	100	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,114	0	1,114	0.0%	-	1,114	3%	1,147	2,400	0.46	0.48	A	A
	Hwy 20	Hwy 58	1,993	0	1,993	0.0%	-	1,993	3%	2,053	2,400	0.83	0.86	D	D
	Hwy 58	Geneva St	2,585	-	2,585	0.0%	-	2,585	3%	2,663	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,044	90	1,134	0.0%	-	1,134	3%	1,168	2,400	0.47	0.49	A	A
RHC Expressway	QEW	Barton	2,956	35	2,990	0.0%	-	2,990	3%	3,080	2,400	1.25	1.28	F	F
	Barton	Queensway	2,932	70	3,002	0.0%	-	3,002	3%	3,092	2,400	1.25	1.29	F	F
	Queensway	King	3,272	70	3,342	0.0%	-	3,342	3%	3,443	2,400	1.39	1.43	F	F
	King	Mud St	3,833	70	3,903	0.0%	-	3,903	3%	4,020	2,400	1.63	1.68	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. C
High Tourist Condition
Year 2021 - Volumes

Facility	Section From	Section To	Base Assignment - Peak Direction Auto	Truck	Total	Adjustment - Local Trucks %	Trucks	Adj Total	Adjustment - Design Hour %	Adj Total	Capacity	Volume/Capacity P.M. Pk Hour	Design Hour	Level of Service P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,802	134	1,936	0.0%	-	1,936	25%	2,420	3,600	0.54	0.67	B	C
	Hwy 420	Hwy 405	3,155	156	3,311	0.0%	-	3,311	25%	4,139	5,400	0.61	0.77	B	C
	Hwy 405	RR 55	4,154	303	4,457	0.0%	-	4,457	38%	6,151	5,400	0.83	1.14	D	F
	RR 55	Ontario Street	4,154	303	4,457	0.0%	-	4,457	38%	6,151	4,500	0.99	1.37	E	F
	Ontario Street	Hwy 406	4,058	249	4,307	0.0%	-	4,307	38%	5,944	5,400	0.80	1.10	C	F
	Hwy 406	Fruitland	4,716	339	5,055	0.0%	-	5,055	25%	6,319	5,400	0.94	1.17	E	F
	Fruitland	Hwy 20	4,274	378	4,652	0.0%	-	4,652	3%	4,792	5,400	0.86	0.89	D	D
	Hwy 20	Hwy 403	5,293	412	5,705	0.0%	-	5,705	3%	5,876	6,000	0.95	0.98	E	E
Hwy 403	Brantford	Hwy 2	1,252	-	1,252	15.0%	188	1,440	3%	1,483	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,622	54	2,676	15.0%	393	3,070	3%	3,162	3,600	0.85	0.88	D	D
	RHC Express.	Aberdeen	3,380	59	3,439	15.0%	507	3,946	3%	4,065	3,600	1.10	1.13	F	F
	Aberdeen	Hwy 6	6,416	98	6,513	0.0%	-	6,513	3%	6,709	6,000	1.09	1.12	F	F
	Hwy 6	QEW	6,443	88	6,530	0.0%	-	6,530	3%	6,726	5,400	1.21	1.25	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,428	13	1,440	6.5%	93	1,533	3%	1,579	1,600	0.96	0.99	E	E
	Rymal Rd	RHC Express.	1,141	13	1,154	6.5%	74	1,228	3%	1,265	1,600	0.77	0.79	C	C
	RHC Express.	Claremont	1,512	13	1,524	6.5%	98	1,623	3%	1,671	2,000	0.81	0.84	D	D
Hwy 53	Hwy 2	Fiddlers Green	330	-	330	12.0%	40	370	3%	381	2,400	0.15	0.16	A	A
	Fiddlers Green	Hwy 6	566	-	566	12.0%	68	634	3%	653	1,200	0.53	0.54	B	B
	Hwy 6	Hwy 56	883	-	883	12.0%	106	989	3%	1,019	2,400	0.41	0.42	A	A
Hwy 20	QEW	Queenston	1,962	124	2,086	0.0%	-	2,086	25%	2,608	1,600	1.30	1.63	F	F
	Queenston	Mud St	2,168	20	2,188	0.0%	-	2,188	25%	2,735	1,600	1.37	1.71	F	F
	Mud St	Hwy 53	1,668	28	1,696	0.0%	-	1,696	25%	2,120	2,400	0.71	0.88	C	D
	Hwy 53	RR 27	581	0	581	7.0%	41	622	25%	778	2,400	0.26	0.32	A	A
	RR 27	Fonthill	323	1	323	7.0%	23	346	25%	433	900	0.38	0.48	A	A
	Fonthill	Hwy 406	1,172	-	1,172	7.0%	82	1,254	25%	1,568	1,800	0.70	0.87	C	D
	Hwy 406	Hwy 58	914	-	914	7.0%	64	978	25%	1,222	900	1.09	1.36	F	F
	Hwy 58	Montrose Rd	1,485	-	1,485	7.0%	104	1,589	25%	1,986	1,600	0.99	1.24	E	F
Hwy 405	QEW	Q-L Bridge	1,465	200	1,666	0.0%	-	1,666	38%	2,299	3,600	0.46	0.64	A	B
Hwy 420	QEW	Stanley Ave	2,218	60	2,278	0.0%	-	2,278	25%	2,848	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	433	33	466	0.0%	-	466	3%	480	900	0.52	0.53	B	B
Hwy 140	Welland	Hwy 3	407	-	407	7.0%	28	435	3%	448	800	0.54	0.56	B	B
Hwy 3	Fort Erie	Hwy 140	516	-	516	4.5%	23	539	3%	555	1,800	0.30	0.31	A	A
	Hwy140	Hwy 58	177	-	177	4.5%	8	185	3%	191	900	0.21	0.21	A	A
	Hwy 58	Wainfleet	93	-	93	4.5%	4	97	3%	100	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,190	0	1,190	0.0%	-	1,190	3%	1,226	2,400	0.50	0.51	A	B
	Hwy 20	Hwy 58	1,997	0	1,998	0.0%	-	1,998	3%	2,058	2,400	0.83	0.86	D	D
	Hwy 58	Geneva St	2,584	0	2,584	0.0%	-	2,584	3%	2,662	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,050	88	1,138	0.0%	-	1,138	3%	1,172	2,400	0.47	0.49	A	A
RHC Expressway	QEW	Barton	2,946	26	2,972	0.0%	-	2,972	3%	3,061	2,400	1.24	1.28	F	F
	Barton	Queensway	2,958	54	3,012	0.0%	-	3,012	3%	3,103	2,400	1.26	1.29	F	F
	Queensway	King	3,292	54	3,346	0.0%	-	3,346	3%	3,446	2,400	1.39	1.44	F	F
	King	Mud St	3,854	54	3,908	0.0%	-	3,908	3%	4,025	2,400	1.63	1.68	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ 8 lane QEW
High Tourist Condition
Year 2021 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,887	254	2,141	0.0%	-	2,141	25%	2,676	3,600	0.59	0.74	B	C
	Hwy 420	Hwy 405	3,917	262	4,179	0.0%	-	4,179	25%	5,224	7,200	0.58	0.73	B	C
	Hwy 405	RR 55	5,420	445	5,866	0.0%	-	5,866	38%	8,095	7,200	0.81	1.12	D	F
	RR 55	Ontario Street	5,420	445	5,866	0.0%	-	5,866	38%	8,095	6,000	0.98	1.35	E	F
	Ontario Street	Hwy 406	5,292	391	5,683	0.0%	-	5,683	38%	7,843	7,200	0.79	1.09	C	F
	Hwy 406	Fruitland	6,100	482	6,582	0.0%	-	6,582	25%	8,228	7,200	0.91	1.14	E	F
	Fruitland	Hwy 20	5,546	550	6,096	0.0%	-	6,096	3%	6,279	7,200	0.85	0.87	D	D
	Hwy 20	Hwy 403	5,710	521	6,232	0.0%	-	6,232	3%	6,419	6,000	1.04	1.07	F	F
Hwy 403	Brantford	Hwy 2	1,242	-	1,242	15.0%	186	1,428	3%	1,471	2,400	0.60	0.61	B	B
	Hwy 2	RHC Express.	2,603	153	2,757	15.0%	391	3,147	3%	3,242	3,600	0.87	0.90	D	E
	RHC Express.	Aberdeen	3,409	124	3,533	15.0%	511	4,045	3%	4,166	3,600	1.12	1.16	F	F
	Aberdeen	Hwy 6	7,095	89	7,184	0.0%	-	7,184	3%	7,400	6,000	1.20	1.23	F	F
	Hwy 6	QEW	7,358	67	7,425	0.0%	-	7,425	3%	7,648	5,400	1.37	1.42	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,529	-	1,529	6.5%	99	1,628	3%	1,677	1,600	1.02	1.05	F	F
	Rymal Rd	RHC Express.	1,190	-	1,190	6.5%	77	1,267	3%	1,305	1,600	0.79	0.82	C	D
	RHC Express.	Claremont	1,548	-	1,548	6.5%	101	1,648	3%	1,698	2,000	0.82	0.85	D	D
Hwy 53	Hwy 2	Fiddlers Green	216	-	216	12.0%	26	242	3%	249	2,400	0.10	0.10	A	A
	Fiddlers Green	Hwy 6	684	-	684	12.0%	82	766	3%	789	1,200	0.64	0.66	B	C
	Hwy 6	Hwy 56	984	-	984	12.0%	118	1,102	3%	1,135	2,400	0.46	0.47	A	A
Hwy 20	QEW	Queenston	2,160	137	2,296	0.0%	-	2,296	25%	2,870	1,600	1.44	1.79	F	F
	Queenston	Mud St	2,244	-	2,244	0.0%	-	2,244	25%	2,805	1,600	1.40	1.75	F	F
	Mud St	Hwy 53	1,199	7	1,206	0.0%	-	1,206	25%	1,508	2,400	0.50	0.63	B	B
	Hwy 53	RR 27	606	7	613	7.0%	42	655	25%	819	2,400	0.27	0.34	A	A
	RR 27	Fonthill	195	9	203	7.0%	14	217	25%	271	900	0.24	0.30	A	A
	Fonthill	Hwy 406	1,127	-	1,127	7.0%	79	1,206	25%	1,507	1,800	0.67	0.84	C	D
	Hwy 406	Hwy 58	912	-	912	7.0%	64	976	25%	1,220	900	1.08	1.36	F	F
	Hwy 58	Montrose Rd	1,486	-	1,486	7.0%	104	1,590	25%	1,988	1,600	0.99	1.24	E	F
Hwy 405	QEW	Q-L Bridge	1,839	183	2,022	0.0%	-	2,022	38%	2,790	3,600	0.56	0.78	B	C
Hwy 420	QEW	Stanley Ave	2,233	30	2,263	0.0%	-	2,263	25%	2,828	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	449	-	449	0.0%	-	449	3%	463	900	0.50	0.51	A	B
Hwy 140	Welland	Hwy 3	417	-	417	7.0%	29	447	3%	460	800	0.56	0.57	B	B
Hwy 3	Fort Erie	Hwy 140	711	-	711	4.5%	32	743	3%	765	1,800	0.41	0.42	A	A
	Hwy140	Hwy 58	169	-	169	4.5%	8	176	3%	181	900	0.20	0.20	A	A
	Hwy 58	Wainfleet	94	-	94	4.5%	4	99	3%	101	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,167	0	1,167	0.0%	-	1,167	3%	1,202	2,400	0.49	0.50	A	B
	Hwy 20	Hwy 58	1,972	0	1,973	0.0%	-	1,973	3%	2,032	2,400	0.82	0.85	D	D
	Hwy 58	Geneva St	2,602	0	2,602	0.0%	-	2,602	3%	2,680	2,400	1.08	1.12	F	F
	Geneva St	QEW	1,082	126	1,208	0.0%	-	1,208	3%	1,244	2,400	0.50	0.52	B	B
RHC Expressway	QEW	Barton	3,149	57	3,206	0.0%	-	3,206	3%	3,302	2,400	1.34	1.38	F	F
	Barton	Queensway	2,929	124	3,054	0.0%	-	3,054	3%	3,145	2,400	1.27	1.31	F	F
	Queensway	King	3,289	124	3,413	0.0%	-	3,413	3%	3,515	2,400	1.42	1.46	F	F
	King	Mud St	3,854	124	3,979	0.0%	-	3,979	3%	4,098	2,400	1.66	1.71	F	F

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ 8 lane QEW and Hwy 420 extension
High Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,883	267	2,150	0.0%	-	2,150	25%	2,687	3,600	0.60	0.75	B	C
	Hwy 420	Hwy 405	3,856	246	4,102	0.0%	-	4,102	25%	5,128	7,200	0.57	0.71	B	C
	Hwy 405	RR 55	5,602	429	6,030	0.0%	-	6,030	38%	8,322	7,200	0.84	1.16	D	F
	RR 55	Ontario Street	5,602	429	6,030	0.0%	-	6,030	38%	8,322	6,000	1.01	1.39	F	F
	Ontario Street	Hwy 406	5,207	402	5,609	0.0%	-	5,609	38%	7,740	7,200	0.78	1.08	C	F
	Hwy 406	Fruitland	6,090	493	6,583	0.0%	-	6,583	25%	8,229	7,200	0.91	1.14	E	F
	Fruitland	Hwy 20	5,581	562	6,142	0.0%	-	6,142	3%	6,327	7,200	0.85	0.88	D	D
	Hwy 20	Hwy 403	6,389	569	6,958	0.0%	-	6,958	3%	7,167	6,000	1.16	1.19	F	F
Hwy 403	Brantford	Hwy 2	1,272	-	1,272	15.0%	191	1,463	3%	1,506	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,846	61	2,907	15.0%	427	3,334	3%	3,434	3,600	0.93	0.95	E	E
	RHC Express.	Aberdeen	3,795	34	3,829	15.0%	569	4,398	3%	4,530	3,600	1.22	1.26	F	F
	Aberdeen	Hwy 6	6,954	86	7,039	0.0%	-	7,039	3%	7,250	6,000	1.17	1.21	F	F
	Hwy 6	QEW	7,101	121	7,221	0.0%	-	7,221	3%	7,438	5,400	1.34	1.38	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,481	-	1,481	6.5%	96	1,578	3%	1,625	1,600	0.99	1.02	E	F
	Rymal Rd	RHC Express.	1,204	-	1,204	6.5%	78	1,282	3%	1,320	1,600	0.80	0.83	D	D
	RHC Express.	Claremont	1,522	-	1,522	6.5%	99	1,621	3%	1,669	2,000	0.81	0.83	D	D
Hwy 53	Hwy 2	Fiddlers Green	260	-	260	12.0%	31	291	3%	300	2,400	0.12	0.12	A	A
	Fiddlers Green	Hwy 6	611	-	611	12.0%	73	684	3%	705	1,200	0.57	0.59	B	B
	Hwy 6	Hwy 56	1,005	-	1,005	12.0%	121	1,126	3%	1,160	2,400	0.47	0.48	A	A
Hwy 20	QEW	Queenston	2,084	140	2,224	0.0%	-	2,224	25%	2,780	1,600	1.39	1.74	F	F
	Queenston	Mud St	2,196	-	2,196	0.0%	-	2,196	25%	2,745	1,600	1.37	1.72	F	F
	Mud St	Hwy 53	1,256	8	1,265	0.0%	-	1,265	25%	1,581	2,400	0.53	0.66	B	C
	Hwy 53	RR 27	603	8	611	7.0%	42	653	25%	817	2,400	0.27	0.34	A	A
	RR 27	Fonthill	192	7	199	7.0%	13	213	25%	266	900	0.24	0.30	A	A
	Fonthill	Hwy 406	1,142	-	1,142	7.0%	80	1,222	25%	1,527	1,800	0.68	0.85	C	D
	Hwy 406	Hwy 58	914	-	914	7.0%	64	978	25%	1,222	900	1.09	1.36	F	F
	Hwy 58	Montrose Rd	1,367	-	1,367	7.0%	96	1,463	25%	1,829	1,600	0.91	1.14	E	F
Hwy 405	QEW	Q-L Bridge	1,838	182	2,020	0.0%	-	2,020	38%	2,788	3,600	0.56	0.77	B	C
Hwy 420	QEW	Stanley Ave	2,226	30	2,255	0.0%	-	2,255	25%	2,819	3,600	0.63	0.78	B	C
Hwy 58	Hwy 406	Hwy 3	432	19	450	0.0%	-	450	3%	464	900	0.50	0.52	B	B
Hwy 140	Welland	Hwy 3	420	-	420	7.0%	29	450	3%	463	800	0.56	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	710	-	710	4.5%	32	742	3%	765	1,800	0.41	0.42	A	A
	Hwy140	Hwy 58	168	-	168	4.5%	8	176	3%	181	900	0.20	0.20	A	A
	Hwy 58	Wainfleet	94	-	94	4.5%	4	98	3%	101	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,143	0	1,143	0.0%	-	1,143	3%	1,177	2,400	0.48	0.49	A	A
	Hwy 20	Hwy 58	1,954	0	1,954	0.0%	-	1,954	3%	2,013	2,400	0.81	0.84	D	D
	Hwy 58	Geneva St	2,554	28	2,582	0.0%	-	2,582	3%	2,659	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,022	121	1,144	0.0%	-	1,144	3%	1,178	2,400	0.48	0.49	A	A
RHC Expressway	QEW	Barton	3,322	10	3,332	0.0%	-	3,332	3%	3,432	2,400	1.39	1.43	F	F
	Barton	Queensway	3,245	34	3,279	0.0%	-	3,279	3%	3,377	2,400	1.37	1.41	F	F
	Queensway	King	3,542	34	3,576	0.0%	-	3,576	3%	3,683	2,400	1.49	1.53	F	F
	King	Mud St	3,988	34	4,022	0.0%	-	4,022	3%	4,142	2,400	1.68	1.73	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

APPENDIX K
2031 ALTERNATIVE NETWORK – LEVEL OF SERVICE

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. A
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,681	210	1,891	0.0%	-	1,891	25%	2,364	3,600	0.53	0.66	B	C
	Hwy 420	Hwy 405	3,161	214	3,375	0.0%	-	3,375	25%	4,219	5,400	0.63	0.78	B	C
	Hwy 405	RR 55	4,070	437	4,508	0.0%	-	4,508	38%	6,221	5,400	0.83	1.15	D	F
	RR 55	Ontario Street	4,070	437	4,508	0.0%	-	4,508	38%	6,221	4,500	1.00	1.38	F	F
	Ontario Street	Hwy 406	3,923	374	4,297	0.0%	-	4,297	38%	5,930	5,400	0.80	1.10	C	F
	Hwy 406	Fruitland	4,595	486	5,080	0.0%	-	5,080	25%	6,350	5,400	0.94	1.18	E	F
	Fruitland	Hwy 20	4,182	557	4,739	0.0%	-	4,739	3%	4,881	5,400	0.88	0.90	D	E
	Hwy 20	Hwy 403	5,591	654	6,245	0.0%	-	6,245	3%	6,432	6,000	1.04	1.07	F	F
Hwy 403	Brantford	Hwy 2	1,155	-	1,155	15.0%	173	1,329	3%	1,369	2,400	0.55	0.57	B	B
	Hwy 2	RHC Express.	2,672	159	2,832	15.0%	401	3,232	3%	3,329	3,600	0.90	0.92	D	E
	RHC Express.	Aberdeen	3,336	106	3,442	15.0%	500	3,943	3%	4,061	3,600	1.10	1.13	F	F
	Aberdeen	Hwy 6	7,293	89	7,382	0.0%	-	7,382	3%	7,603	6,000	1.23	1.27	F	F
	Hwy 6	QEW	7,464	68	7,532	0.0%	-	7,532	3%	7,758	5,400	1.39	1.44	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,431	-	1,431	6.5%	93	1,524	3%	1,570	1,600	0.95	0.98	E	E
	Rymal Rd	RHC Express.	1,178	-	1,178	6.5%	77	1,254	3%	1,292	1,600	0.78	0.81	C	D
	RHC Express.	Claremont	1,628	-	1,628	6.5%	106	1,734	3%	1,786	2,000	0.87	0.89	D	D
Hwy 53	Hwy 2	Fiddlers Green	257	-	257	12.0%	31	288	3%	296	2,400	0.12	0.12	A	A
	Fiddlers Green	Hwy 6	689	3	692	12.0%	83	774	3%	798	1,200	0.65	0.66	B	C
	Hwy 6	Hwy 56	856	24	879	12.0%	103	982	3%	1,012	2,400	0.41	0.42	A	A
Hwy 20	QEW	Queenston	2,055	162	2,217	0.0%	-	2,217	25%	2,772	1,600	1.39	1.73	F	F
	Queenston	Mud St	2,208	20	2,228	0.0%	-	2,228	25%	2,785	1,600	1.39	1.74	F	F
	Mud St	Hwy 53	1,804	62	1,866	0.0%	-	1,866	25%	2,333	2,400	0.78	0.97	C	E
	Hwy 53	RR 27	632	-	632	7.0%	44	676	25%	845	2,400	0.28	0.35	A	A
	RR 27	Fonthill	505	9	514	7.0%	35	549	25%	686	900	0.61	0.76	B	C
	Fonthill	Hwy 406	1,299	8	1,307	7.0%	91	1,398	25%	1,748	1,800	0.78	0.97	C	E
	Hwy 406	Hwy 58	966	9	975	7.0%	68	1,043	25%	1,304	900	1.16	1.45	F	F
	Hwy 58	Montrose Rd	1,529	-	1,529	7.0%	107	1,636	25%	2,045	1,600	1.02	1.28	F	F
Hwy 405	QEW	Q-L Bridge	1,564	329	1,892	0.0%	-	1,892	38%	2,611	3,600	0.53	0.73	B	C
Hwy 420	QEW	Stanley Ave	2,232	38	2,270	0.0%	-	2,270	25%	2,837	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	408	36	443	0.0%	-	443	3%	457	900	0.49	0.51	A	B
Hwy 140	Welland	Hwy 3	356	-	356	7.0%	25	381	3%	393	800	0.48	0.49	A	A
Hwy 3	Fort Erie	Hwy 140	567	-	567	4.5%	26	593	3%	611	1,800	0.33	0.34	A	A
	Hwy140	Hwy 58	207	-	207	4.5%	9	217	3%	223	900	0.24	0.25	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,273	0	1,273	0.0%	-	1,273	3%	1,311	2,400	0.53	0.55	B	B
	Hwy 20	Hwy 58	2,056	4	2,060	0.0%	-	2,060	3%	2,122	2,400	0.86	0.88	D	D
	Hwy 58	Geneva St	2,616	3	2,619	0.0%	-	2,619	3%	2,697	2,400	1.09	1.12	F	F
	Geneva St	QEW	1,027	107	1,134	0.0%	-	1,134	3%	1,168	2,400	0.47	0.49	A	A
RHC Expressway	QEW	Barton	3,012	130	3,142	0.0%	-	3,142	3%	3,236	2,400	1.31	1.35	F	F
	Barton	Queensway	3,038	162	3,200	0.0%	-	3,200	3%	3,295	2,400	1.33	1.37	F	F
	Queensway	King	3,422	162	3,583	0.0%	-	3,583	3%	3,691	2,400	1.49	1.54	F	F
	King	Mud St	4,300	172	4,473	0.0%	-	4,473	3%	4,607	2,400	1.86	1.92	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. B
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,795	168	1,963	0.0%	-	1,963	25%	2,454	3,600	0.55	0.68	B	C
	Hwy 420	Hwy 405	3,135	173	3,308	0.0%	-	3,308	25%	4,135	5,400	0.61	0.77	B	C
	Hwy 405	RR 55	4,109	385	4,494	0.0%	-	4,494	38%	6,202	5,400	0.83	1.15	D	F
	RR 55	Ontario Street	4,109	385	4,494	0.0%	-	4,494	38%	6,202	4,500	1.00	1.38	E	F
	Ontario Street	Hwy 406	4,001	319	4,320	0.0%	-	4,320	38%	5,962	5,400	0.80	1.10	D	F
	Hwy 406	Fruitland	4,644	429	5,073	0.0%	-	5,073	25%	6,341	5,400	0.94	1.17	E	F
	Fruitland	Hwy 20	4,304	510	4,815	0.0%	-	4,815	3%	4,959	5,400	0.89	0.92	D	E
	Hwy 20	Hwy 403	5,520	579	6,099	0.0%	-	6,099	3%	6,282	6,000	1.02	1.05	F	F
Hwy 403	Brantford	Hwy 2	1,102	-	1,102	15.0%	165	1,267	3%	1,305	2,400	0.53	0.54	B	B
	Hwy 2	RHC Express.	2,772	52	2,824	15.0%	416	3,240	3%	3,337	3,600	0.90	0.93	D	E
	RHC Express.	Aberdeen	3,594	52	3,646	15.0%	539	4,185	3%	4,310	3,600	1.16	1.20	F	F
	Aberdeen	Hwy 6	7,244	81	7,326	0.0%	-	7,326	3%	7,546	6,000	1.22	1.26	F	F
	Hwy 6	QEW	7,416	79	7,496	0.0%	-	7,496	3%	7,721	5,400	1.39	1.43	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,546	9	1,556	6.5%	101	1,656	3%	1,706	1,600	1.04	1.07	F	F
	Rymal Rd	RHC Express.	1,251	9	1,260	6.5%	81	1,342	3%	1,382	1,600	0.84	0.86	D	D
	RHC Express.	Claremont	1,659	9	1,669	6.5%	108	1,776	3%	1,830	2,000	0.89	0.91	D	E
Hwy 53	Hwy 2	Fiddlers Green	272	-	272	12.0%	33	304	3%	313	2,400	0.13	0.13	A	A
	Fiddlers Green	Hwy 6	762	-	762	12.0%	91	854	3%	879	1,200	0.71	0.73	C	C
	Hwy 6	Hwy 56	903	-	903	12.0%	108	1,012	3%	1,042	2,400	0.42	0.43	A	A
Hwy 20	QEW	Queenston	2,047	172	2,219	0.0%	-	2,219	25%	2,773	1,600	1.39	1.73	F	F
	Queenston	Mud St	2,280	22	2,303	0.0%	-	2,303	25%	2,878	1,600	1.44	1.80	F	F
	Mud St	Hwy 53	1,638	57	1,696	0.0%	-	1,696	25%	2,120	2,400	0.71	0.88	C	D
	Hwy 53	RR 27	683	17	701	7.0%	48	748	25%	936	2,400	0.31	0.39	A	A
	RR 27	Fonthill	409	2	411	7.0%	29	439	25%	549	900	0.49	0.61	A	B
	Fonthill	Hwy 406	1,378	-	1,378	7.0%	96	1,475	25%	1,843	1,800	0.82	1.02	D	F
	Hwy 406	Hwy 58	939	-	939	7.0%	66	1,005	25%	1,256	900	1.12	1.40	F	F
	Hwy 58	Montrose Rd	1,530	-	1,530	7.0%	107	1,637	25%	2,046	1,600	1.02	1.28	F	F
Hwy 405	QEW	Q-L Bridge	1,566	253	1,819	0.0%	-	1,819	38%	2,510	3,600	0.51	0.70	B	C
Hwy 420	QEW	Stanley Ave	2,257	67	2,324	0.0%	-	2,324	25%	2,905	3,600	0.65	0.81	B	D
Hwy 58	Hwy 406	Hwy 3	402	52	453	0.0%	-	453	3%	467	900	0.50	0.52	B	B
Hwy 140	Welland	Hwy 3	346	-	346	7.0%	24	370	3%	381	800	0.46	0.48	A	A
Hwy 3	Fort Erie	Hwy 140	556	-	556	4.5%	25	581	3%	599	1,800	0.32	0.33	A	A
	Hwy140	Hwy 58	219	-	219	4.5%	10	228	3%	235	900	0.25	0.26	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,244	0	1,244	0.0%	-	1,244	3%	1,282	2,400	0.52	0.53	B	B
	Hwy 20	Hwy 58	2,082	0	2,082	0.0%	-	2,082	3%	2,145	2,400	0.87	0.89	D	D
	Hwy 58	Geneva St	2,664	0	2,664	0.0%	-	2,664	3%	2,744	2,400	1.11	1.14	F	F
	Geneva St	QEW	1,052	106	1,157	0.0%	-	1,157	3%	1,192	2,400	0.48	0.50	A	A
RHC Expressway	QEW	Barton	2,971	6	2,977	0.0%	-	2,977	3%	3,066	2,400	1.24	1.28	F	F
	Barton	Queensway	3,043	50	3,093	0.0%	-	3,093	3%	3,186	2,400	1.29	1.33	F	F
	Queensway	King	3,429	50	3,479	0.0%	-	3,479	3%	3,583	2,400	1.45	1.49	F	F
	King	Mud St	4,019	50	4,069	0.0%	-	4,069	3%	4,191	2,400	1.70	1.75	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. B2, Grimsby Link
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,823	54	1,877	0.0%	-	1,877	25%	2,347	3,600	0.52	0.65	B	C
	Hwy 420	Hwy 405	3,161	71	3,232	0.0%	-	3,232	25%	4,039	5,400	0.60	0.75	B	C
	Hwy 405	RR 55	4,067	305	4,371	0.0%	-	4,371	38%	6,032	5,400	0.81	1.12	D	F
	RR 55	Ontario Street	4,067	305	4,371	0.0%	-	4,371	38%	6,032	4,500	0.97	1.34	E	F
	Ontario Street	Hwy 406	3,908	238	4,147	0.0%	-	4,147	38%	5,722	5,400	0.77	1.06	C	F
	Hwy 406	Fruitland	4,574	350	4,924	0.0%	-	4,924	25%	6,156	5,400	0.91	1.14	E	F
	Fruitland	Hwy 20	4,432	568	5,000	0.0%	-	5,000	3%	5,150	5,400	0.93	0.95	E	E
	Hwy 20	Hwy 403	5,532	612	6,144	0.0%	-	6,144	3%	6,328	6,000	1.02	1.05	F	F
Hwy 403	Brantford	Hwy 2	1,082	-	1,082	15.0%	162	1,245	3%	1,282	2,400	0.52	0.53	B	B
	Hwy 2	RHC Express.	2,789	49	2,838	15.0%	418	3,256	3%	3,354	3,600	0.90	0.93	E	E
	RHC Express.	Aberdeen	3,617	49	3,666	15.0%	543	4,209	3%	4,335	3,600	1.17	1.20	F	F
	Aberdeen	Hwy 6	7,248	83	7,332	0.0%	-	7,332	3%	7,552	6,000	1.22	1.26	F	F
	Hwy 6	QEW	7,350	82	7,432	0.0%	-	7,432	3%	7,655	5,400	1.38	1.42	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,518	-	1,518	6.5%	99	1,617	3%	1,665	1,600	1.01	1.04	F	F
	Rymal Rd	RHC Express.	1,210	-	1,210	6.5%	79	1,289	3%	1,327	1,600	0.81	0.83	D	D
	RHC Express.	Claremont	1,603	-	1,603	6.5%	104	1,707	3%	1,758	2,000	0.85	0.88	D	D
Hwy 53	Hwy 2	Fiddlers Green	275	-	275	12.0%	33	308	3%	317	2,400	0.13	0.13	A	A
	Fiddlers Green	Hwy 6	735	-	735	12.0%	88	823	3%	848	1,200	0.69	0.71	C	C
	Hwy 6	Hwy 56	886	-	886	12.0%	106	992	3%	1,022	2,400	0.41	0.43	A	A
Hwy 20	QEW	Queenston	2,069	159	2,228	0.0%	-	2,228	25%	2,785	1,600	1.39	1.74	F	F
	Queenston	Mud St	2,271	-	2,271	0.0%	-	2,271	25%	2,838	1,600	1.42	1.77	F	F
	Mud St	Hwy 53	1,516	22	1,538	0.0%	-	1,538	25%	1,922	2,400	0.64	0.80	B	D
	Hwy 53	RR 27	557	-	557	7.0%	39	596	25%	745	2,400	0.25	0.31	A	A
	RR 27	Fonthill	393	-	393	7.0%	27	420	25%	525	900	0.47	0.58	A	B
	Fonthill	Hwy 406	1,368	-	1,368	7.0%	96	1,463	25%	1,829	1,800	0.81	1.02	D	F
	Hwy 406	Hwy 58	941	-	941	7.0%	66	1,007	25%	1,259	900	1.12	1.40	F	F
	Hwy 58	Montrose Rd	1,525	-	1,525	7.0%	107	1,632	25%	2,040	1,600	1.02	1.27	F	F
Hwy 405	QEW	Q-L Bridge	1,530	256	1,786	0.0%	-	1,786	38%	2,465	3,600	0.50	0.68	A	C
Hwy 420	QEW	Stanley Ave	2,244	37	2,282	0.0%	-	2,282	25%	2,852	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	403	41	444	0.0%	-	444	3%	457	900	0.49	0.51	A	B
Hwy 140	Welland	Hwy 3	327	-	327	7.0%	23	350	3%	360	800	0.44	0.45	A	A
Hwy 3	Fort Erie	Hwy 140	585	-	585	4.5%	26	611	3%	629	1,800	0.34	0.35	A	A
	Hwy140	Hwy 58	263	-	263	4.5%	12	275	3%	283	900	0.31	0.31	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	-	-	-	4.5%	-	-	3%	-	900	-	-	A	A
Hwy 406	East Main Street	Hwy 20	1,169	0	1,170	0.0%	-	1,170	3%	1,205	2,400	0.49	0.50	A	B
	Hwy 20	Hwy 58	2,026	0	2,026	0.0%	-	2,026	3%	2,087	2,400	0.84	0.87	D	D
	Hwy 58	Geneva St	2,618	0	2,618	0.0%	-	2,618	3%	2,697	2,400	1.09	1.12	F	F
	Geneva St	QEW	1,070	103	1,173	0.0%	-	1,173	3%	1,208	2,400	0.49	0.50	A	B
RHC Expressway	QEW	Barton	2,942	3	2,945	0.0%	-	2,945	3%	3,033	2,400	1.23	1.26	F	F
	Barton	Queensway	2,978	49	3,027	0.0%	-	3,027	3%	3,117	2,400	1.26	1.30	F	F
	Queensway	King	3,439	49	3,488	0.0%	-	3,488	3%	3,593	2,400	1.45	1.50	F	F
	King	Mud St	3,983	49	4,032	0.0%	-	4,032	3%	4,153	2,400	1.68	1.73	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. C
Low Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,706	297	2,003	0.0%	-	2,003	25%	2,503	3,600	0.56	0.70	B	C
	Hwy 420	Hwy 405	3,128	197	3,324	0.0%	-	3,324	25%	4,156	5,400	0.62	0.77	B	C
	Hwy 405	RR 55	3,878	415	4,293	0.0%	-	4,293	38%	5,925	5,400	0.80	1.10	C	F
	RR 55	Ontario Street	3,878	415	4,293	0.0%	-	4,293	38%	5,925	4,500	0.95	1.32	E	F
	Ontario Street	Hwy 406	3,790	349	4,139	0.0%	-	4,139	38%	5,712	5,400	0.77	1.06	C	F
	Hwy 406	Fruitland	4,448	460	4,908	0.0%	-	4,908	25%	6,135	5,400	0.91	1.14	E	F
	Fruitland	Hwy 20	4,022	514	4,536	0.0%	-	4,536	3%	4,672	5,400	0.84	0.87	D	D
	Hwy 20	Hwy 403	5,178	550	5,727	0.0%	-	5,727	3%	5,899	6,000	0.95	0.98	E	E
Hwy 403	Brantford	Hwy 2	1,274	-	1,274	15.0%	191	1,466	3%	1,510	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,613	78	2,691	15.0%	392	3,083	3%	3,176	3,600	0.86	0.88	D	D
	RHC Express.	Aberdeen	3,360	87	3,448	15.0%	504	3,952	3%	4,070	3,600	1.10	1.13	F	F
	Aberdeen	Hwy 6	6,468	114	6,583	0.0%	-	6,583	3%	6,780	6,000	1.10	1.13	F	F
	Hwy 6	QEW	6,524	108	6,632	0.0%	-	6,632	3%	6,831	5,400	1.23	1.26	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,453	10	1,463	6.5%	94	1,557	3%	1,604	1,600	0.97	1.00	E	F
	Rymal Rd	RHC Express.	1,160	10	1,169	6.5%	75	1,245	3%	1,282	1,600	0.78	0.80	C	D
	RHC Express.	Claremont	1,555	10	1,565	6.5%	101	1,666	3%	1,716	2,000	0.83	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	346	-	346	12.0%	42	388	3%	399	2,400	0.16	0.17	A	A
	Fiddlers Green	Hwy 6	595	-	595	12.0%	71	667	3%	687	1,200	0.56	0.57	B	B
	Hwy 6	Hwy 56	869	-	869	12.0%	104	973	3%	1,002	2,400	0.41	0.42	A	A
Hwy 20	QEW	Queenston	1,971	152	2,123	0.0%	-	2,123	25%	2,654	1,600	1.33	1.66	F	F
	Queenston	Mud St	2,172	22	2,194	0.0%	-	2,194	25%	2,743	1,600	1.37	1.71	F	F
	Mud St	Hwy 53	1,693	36	1,729	0.0%	-	1,729	25%	2,161	2,400	0.72	0.90	C	E
	Hwy 53	RR 27	613	-	613	7.0%	43	656	25%	820	2,400	0.27	0.34	A	A
	RR 27	Fonthill	303	1	304	7.0%	21	325	25%	406	900	0.36	0.45	A	A
	Fonthill	Hwy 406	1,175	-	1,175	7.0%	82	1,258	25%	1,572	1,800	0.70	0.87	C	D
	Hwy 406	Hwy 58	922	-	922	7.0%	65	986	25%	1,233	900	1.10	1.37	F	F
	Hwy 58	Montrose Rd	1,513	-	1,513	7.0%	106	1,619	25%	2,024	1,600	1.01	1.26	F	F
Hwy 405	QEW	Q-L Bridge	1,103	219	1,322	0.0%	-	1,322	38%	1,824	3,600	0.37	0.51	A	B
Hwy 420	QEW	Stanley Ave	2,119	54	2,173	0.0%	-	2,173	25%	2,717	3,600	0.60	0.75	B	C
Hwy 58	Hwy 406	Hwy 3	426	36	462	0.0%	-	462	3%	476	900	0.51	0.53	B	B
Hwy 140	Welland	Hwy 3	425	-	425	7.0%	30	455	3%	468	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	394	-	394	4.5%	18	412	3%	424	1,800	0.23	0.24	A	A
	Hwy140	Hwy 58	171	-	171	4.5%	8	179	3%	185	900	0.20	0.21	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,144	0	1,144	0.0%	-	1,144	3%	1,178	2,400	0.48	0.49	A	A
	Hwy 20	Hwy 58	2,012	0	2,012	0.0%	-	2,012	3%	2,072	2,400	0.84	0.86	D	D
	Hwy 58	Geneva St	2,622	0	2,622	0.0%	-	2,622	3%	2,701	2,400	1.09	1.13	F	F
	Geneva St	QEW	1,066	107	1,173	0.0%	-	1,173	3%	1,208	2,400	0.49	0.50	A	B
RHC Expressway	QEW	Barton	2,962	27	2,990	0.0%	-	2,990	3%	3,079	2,400	1.25	1.28	F	F
	Barton	Queensway	2,922	78	3,000	0.0%	-	3,000	3%	3,090	2,400	1.25	1.29	F	F
	Queensway	King	3,293	78	3,371	0.0%	-	3,371	3%	3,472	2,400	1.40	1.45	F	F
	King	Mud St	3,872	78	3,950	0.0%	-	3,950	3%	4,068	2,400	1.65	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. C
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,819	148	1,966	0.0%	-	1,966	25%	2,458	3,600	0.55	0.68	B	C
	Hwy 420	Hwy 405	3,164	146	3,310	0.0%	-	3,310	25%	4,138	5,400	0.61	0.77	B	C
	Hwy 405	RR 55	4,081	392	4,473	0.0%	-	4,473	38%	6,173	5,400	0.83	1.14	D	F
	RR 55	Ontario Street	4,081	392	4,473	0.0%	-	4,473	38%	6,173	4,500	0.99	1.37	E	F
	Ontario Street	Hwy 406	3,935	326	4,261	0.0%	-	4,261	38%	5,880	5,400	0.79	1.09	C	F
	Hwy 406	Fruitland	4,610	437	5,047	0.0%	-	5,047	25%	6,309	5,400	0.93	1.17	E	F
	Fruitland	Hwy 20	4,194	496	4,690	0.0%	-	4,690	3%	4,830	5,400	0.87	0.89	D	D
	Hwy 20	Hwy 403	5,208	514	5,722	0.0%	-	5,722	3%	5,893	6,000	0.95	0.98	E	E
Hwy 403	Brantford	Hwy 2	1,265	-	1,265	15.0%	190	1,454	3%	1,498	2,400	0.61	0.62	B	B
	Hwy 2	RHC Express.	2,625	71	2,695	15.0%	394	3,089	3%	3,182	3,600	0.86	0.88	D	D
	RHC Express.	Aberdeen	3,412	86	3,498	15.0%	512	4,010	3%	4,130	3,600	1.11	1.15	F	F
	Aberdeen	Hwy 6	6,511	122	6,633	0.0%	-	6,633	3%	6,832	6,000	1.11	1.14	F	F
	Hwy 6	QEW	6,563	113	6,677	0.0%	-	6,677	3%	6,877	5,400	1.24	1.27	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,487	7	1,494	6.5%	97	1,591	3%	1,639	1,600	0.99	1.02	E	F
	Rymal Rd	RHC Express.	1,176	2	1,178	6.5%	76	1,254	3%	1,292	1,600	0.78	0.81	C	D
	RHC Express.	Claremont	1,588	2	1,590	6.5%	103	1,693	3%	1,744	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	337	-	337	12.0%	40	377	3%	389	2,400	0.16	0.16	A	A
	Fiddlers Green	Hwy 6	608	-	608	12.0%	73	681	3%	702	1,200	0.57	0.58	B	B
	Hwy 6	Hwy 56	920	-	920	12.0%	110	1,031	3%	1,062	2,400	0.43	0.44	A	A
Hwy 20	QEW	Queenston	2,045	152	2,197	0.0%	-	2,197	25%	2,747	1,600	1.37	1.72	F	F
	Queenston	Mud St	2,222	16	2,238	0.0%	-	2,238	25%	2,798	1,600	1.40	1.75	F	F
	Mud St	Hwy 53	1,719	35	1,753	0.0%	-	1,753	25%	2,192	2,400	0.73	0.91	C	E
	Hwy 53	RR 27	652	0	652	7.0%	46	698	25%	872	2,400	0.29	0.36	A	A
	RR 27	Fonthill	397	1	397	7.0%	28	425	25%	531	900	0.47	0.59	A	B
	Fonthill	Hwy 406	1,224	-	1,224	7.0%	86	1,310	25%	1,637	1,800	0.73	0.91	C	E
	Hwy 406	Hwy 58	959	-	959	7.0%	67	1,026	25%	1,282	900	1.14	1.42	F	F
	Hwy 58	Montrose Rd	1,533	-	1,533	7.0%	107	1,641	25%	2,051	1,600	1.03	1.28	F	F
Hwy 405	QEW	Q-L Bridge	1,535	270	1,805	0.0%	-	1,805	38%	2,492	3,600	0.50	0.69	B	C
Hwy 420	QEW	Stanley Ave	2,246	68	2,313	0.0%	-	2,313	25%	2,891	3,600	0.64	0.80	B	D
Hwy 58	Hwy 406	Hwy 3	409	48	457	0.0%	-	457	3%	470	900	0.51	0.52	B	B
Hwy 140	Welland	Hwy 3	431	-	431	7.0%	30	461	3%	475	800	0.58	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	572	-	572	4.5%	26	598	3%	616	1,800	0.33	0.34	A	A
	Hwy140	Hwy 58	229	-	229	4.5%	10	239	3%	246	900	0.27	0.27	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,200	0	1,201	0.0%	-	1,201	3%	1,237	2,400	0.50	0.52	B	B
	Hwy 20	Hwy 58	2,080	0	2,080	0.0%	-	2,080	3%	2,143	2,400	0.87	0.89	D	D
	Hwy 58	Geneva St	2,655	0	2,655	0.0%	-	2,655	3%	2,735	2,400	1.11	1.14	F	F
	Geneva St	QEW	1,055	107	1,162	0.0%	-	1,162	3%	1,197	2,400	0.48	0.50	A	A
RHC Expressway	QEW	Barton	2,855	25	2,880	0.0%	-	2,880	3%	2,967	2,400	1.20	1.24	F	F
	Barton	Queensway	2,959	71	3,030	0.0%	-	3,030	3%	3,121	2,400	1.26	1.30	F	F
	Queensway	King	3,263	71	3,333	0.0%	-	3,333	3%	3,433	2,400	1.39	1.43	F	F
	King	Mud St	3,872	71	3,943	0.0%	-	3,943	3%	4,061	2,400	1.64	1.69	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. D
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,829	288	2,117	0.0%	-	2,117	25%	2,646	3,600	0.59	0.73	B	C
	Hwy 420	Hwy 405	2,984	234	3,217	0.0%	-	3,217	25%	4,021	5,400	0.60	0.74	B	C
	Hwy 405	RR 55	3,912	425	4,337	0.0%	-	4,337	38%	5,985	5,400	0.80	1.11	D	F
	RR 55	Ontario Street	3,912	425	4,337	0.0%	-	4,337	38%	5,985	4,500	0.96	1.33	E	F
	Ontario Street	Hwy 406	3,732	363	4,095	0.0%	-	4,095	38%	5,651	5,400	0.76	1.05	C	F
	Hwy 406	Fruitland	4,365	467	4,831	0.0%	-	4,831	25%	6,039	5,400	0.89	1.12	D	F
	Fruitland	Hwy 20	4,174	514	4,688	0.0%	-	4,688	3%	4,829	5,400	0.87	0.89	D	D
	Hwy 20	Hwy 403	5,260	532	5,792	0.0%	-	5,792	3%	5,966	6,000	0.97	0.99	E	E
Hwy 403	Brantford	Hwy 2	1,262	-	1,262	15.0%	189	1,452	3%	1,495	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,720	46	2,766	15.0%	408	3,174	3%	3,269	3,600	0.88	0.91	D	E
	RHC Express.	Aberdeen	3,470	46	3,516	15.0%	521	4,037	3%	4,158	3,600	1.12	1.15	F	F
	Aberdeen	Hwy 6	6,504	114	6,619	0.0%	-	6,619	3%	6,817	6,000	1.10	1.14	F	F
	Hwy 6	QEW	6,513	94	6,607	0.0%	-	6,607	3%	6,805	5,400	1.22	1.26	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,496	0	1,496	6.5%	97	1,594	3%	1,641	1,600	1.00	1.03	E	F
	Rymal Rd	RHC Express.	1,203	0	1,203	6.5%	78	1,281	3%	1,319	1,600	0.80	0.82	D	D
	RHC Express.	Claremont	1,577	0	1,577	6.5%	102	1,679	3%	1,730	2,000	0.84	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	289	-	289	12.0%	35	324	3%	333	2,400	0.13	0.14	A	A
	Fiddlers Green	Hwy 6	631	-	631	12.0%	76	707	3%	728	1,200	0.59	0.61	B	B
	Hwy 6	Hwy 56	920	-	920	12.0%	110	1,030	3%	1,061	2,400	0.43	0.44	A	A
Hwy 20	QEW	Queenston	2,057	165	2,222	0.0%	-	2,222	25%	2,777	1,600	1.39	1.74	F	F
	Queenston	Mud St	2,240	-	2,240	0.0%	-	2,240	25%	2,800	1,600	1.40	1.75	F	F
	Mud St	Hwy 53	1,407	9	1,416	0.0%	-	1,416	25%	1,770	2,400	0.59	0.74	B	C
	Hwy 53	RR 27	684	9	693	7.0%	48	741	25%	927	2,400	0.31	0.39	A	A
	RR 27	Fonthill	475	-	475	7.0%	33	508	25%	635	900	0.56	0.71	B	C
	Fonthill	Hwy 406	1,026	-	1,026	7.0%	72	1,098	25%	1,372	1,800	0.61	0.76	B	C
	Hwy 406	Hwy 58	841	-	841	7.0%	59	900	25%	1,125	900	1.00	1.25	F	F
	Hwy 58	Montrose Rd	1,206	-	1,206	7.0%	84	1,290	25%	1,613	1,600	0.81	1.01	D	F
Hwy 405	QEW	Q-L Bridge	1,579	211	1,791	0.0%	-	1,791	38%	2,472	3,600	0.50	0.69	A	C
Hwy 420	QEW	Stanley Ave	2,411	58	2,469	0.0%	-	2,469	25%	3,087	3,600	0.69	0.86	C	D
Hwy 58	Hwy 406	Hwy 3	438	16	454	0.0%	-	454	3%	468	900	0.50	0.52	B	B
Hwy 140	Welland	Hwy 3	442	-	442	7.0%	31	473	3%	487	800	0.59	0.61	B	B
Hwy 3	Fort Erie	Hwy 140	775	-	775	4.5%	35	810	3%	834	1,800	0.45	0.46	A	A
	Hwy140	Hwy 58	148	-	148	4.5%	7	154	3%	159	900	0.17	0.18	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,169	10	1,179	0.0%	-	1,179	3%	1,215	2,400	0.49	0.51	A	B
	Hwy 20	Hwy 58	1,977	7	1,983	0.0%	-	1,983	3%	2,043	2,400	0.83	0.85	D	D
	Hwy 58	Geneva St	2,580	21	2,601	0.0%	-	2,601	3%	2,679	2,400	1.08	1.12	F	F
	Geneva St	QEW	1,063	105	1,167	0.0%	-	1,167	3%	1,202	2,400	0.49	0.50	A	B
RHC Expressway	QEW	Barton	2,945	-	2,945	0.0%	-	2,945	3%	3,033	2,400	1.23	1.26	F	F
	Barton	Queensway	2,966	46	3,012	0.0%	-	3,012	3%	3,102	2,400	1.25	1.29	F	F
	Queensway	King	3,344	46	3,389	0.0%	-	3,389	3%	3,491	2,400	1.41	1.45	F	F
	King	Mud St	3,921	46	3,966	0.0%	-	3,966	3%	4,085	2,400	1.65	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. D2
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	2,995	134	3,129	0.0%	-	3,129	25%	3,911	3,600	0.87	1.09	D	F
	Hwy 420	Hwy 405	3,124	87	3,211	0.0%	-	3,211	25%	4,014	5,400	0.59	0.74	B	C
	Hwy 405	RR 55	3,954	378	4,332	0.0%	-	4,332	38%	5,979	5,400	0.80	1.11	D	F
	RR 55	Ontario Street	3,954	378	4,332	0.0%	-	4,332	38%	5,979	4,500	0.96	1.33	E	F
	Ontario Street	Hwy 406	3,674	331	4,006	0.0%	-	4,006	38%	5,528	5,400	0.74	1.02	C	F
	Hwy 406	Fruitland	4,420	425	4,846	0.0%	-	4,846	25%	6,057	5,400	0.90	1.12	D	F
	Fruitland	Hwy 20	4,154	499	4,653	0.0%	-	4,653	3%	4,793	5,400	0.86	0.89	D	D
	Hwy 20	Hwy 403	5,208	535	5,743	0.0%	-	5,743	3%	5,915	6,000	0.96	0.99	E	E
Hwy 403	Brantford	Hwy 2	1,269	-	1,269	15.0%	190	1,459	3%	1,503	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,705	61	2,766	15.0%	406	3,172	3%	3,267	3,600	0.88	0.91	D	E
	RHC Express.	Aberdeen	3,433	61	3,495	15.0%	515	4,010	3%	4,130	3,600	1.11	1.15	F	F
	Aberdeen	Hwy 6	6,506	119	6,625	0.0%	-	6,625	3%	6,824	6,000	1.10	1.14	F	F
	Hwy 6	QEW	6,603	101	6,704	0.0%	-	6,704	3%	6,905	5,400	1.24	1.28	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,481	10	1,491	6.5%	96	1,587	3%	1,635	1,600	0.99	1.02	E	F
	Rymal Rd	RHC Express.	1,146	4	1,150	6.5%	74	1,224	3%	1,261	1,600	0.77	0.79	C	C
	RHC Express.	Claremont	1,575	4	1,579	6.5%	102	1,682	3%	1,732	2,000	0.84	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	284	-	284	12.0%	34	318	3%	328	2,400	0.13	0.14	A	A
	Fiddlers Green	Hwy 6	621	-	621	12.0%	74	695	3%	716	1,200	0.58	0.60	B	B
	Hwy 6	Hwy 56	934	-	934	12.0%	112	1,046	3%	1,078	2,400	0.44	0.45	A	A
Hwy 20	QEW	Queenston	2,025	158	2,184	0.0%	-	2,184	25%	2,729	1,600	1.36	1.71	F	F
	Queenston	Mud St	2,245	-	2,245	0.0%	-	2,245	25%	2,807	1,600	1.40	1.75	F	F
	Mud St	Hwy 53	1,400	17	1,417	0.0%	-	1,417	25%	1,771	2,400	0.59	0.74	B	C
	Hwy 53	RR 27	670	17	687	7.0%	47	734	25%	917	2,400	0.31	0.38	A	A
	RR 27	Fonthill	475	9	484	7.0%	33	517	25%	646	900	0.57	0.72	B	C
	Fonthill	Hwy 406	1,224	-	1,224	7.0%	86	1,310	25%	1,637	1,800	0.73	0.91	C	E
	Hwy 406	Hwy 58	721	-	721	7.0%	50	771	25%	964	900	0.86	1.07	D	F
	Hwy 58	Montrose Rd	1,413	-	1,413	7.0%	99	1,512	25%	1,890	1,600	0.94	1.18	E	F
Hwy 405	QEW	Q-L Bridge	1,446	287	1,733	0.0%	-	1,733	38%	2,392	3,600	0.48	0.66	A	C
Hwy 420	QEW	Stanley Ave	2,243	76	2,318	0.0%	-	2,318	25%	2,898	3,600	0.64	0.80	B	D
Hwy 58	Hwy 406	Hwy 3	397	-	397	0.0%	-	397	3%	409	900	0.44	0.45	A	A
Hwy 140	Welland	Hwy 3	458	-	458	7.0%	32	490	3%	505	800	0.61	0.63	B	B
Hwy 3	Fort Erie	Hwy 140	768	-	768	4.5%	35	803	3%	827	1,800	0.45	0.46	A	A
	Hwy140	Hwy 58	143	-	143	4.5%	6	150	3%	154	900	0.17	0.17	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	988	112	1,100	0.0%	-	1,100	3%	1,133	2,400	0.46	0.47	A	A
	Hwy 20	Hwy 58	1,903	6	1,909	0.0%	-	1,909	3%	1,967	2,400	0.80	0.82	C	D
	Hwy 58	Geneva St	2,542	20	2,562	0.0%	-	2,562	3%	2,639	2,400	1.07	1.10	F	F
	Geneva St	QEW	1,043	97	1,140	0.0%	-	1,140	3%	1,174	2,400	0.47	0.49	A	A
RHC Expressway	QEW	Barton	2,966	11	2,977	0.0%	-	2,977	3%	3,066	2,400	1.24	1.28	F	F
	Barton	Queensway	2,921	57	2,977	0.0%	-	2,977	3%	3,067	2,400	1.24	1.28	F	F
	Queensway	King	3,272	57	3,329	0.0%	-	3,329	3%	3,429	2,400	1.39	1.43	F	F
	King	Mud St	3,883	57	3,940	0.0%	-	3,940	3%	4,058	2,400	1.64	1.69	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ MPC Alt. E
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,681	236	1,917	0.0%	-	1,917	25%	2,397	3,600	0.53	0.67	B	C
	Hwy 420	Hwy 405	1,249	151	1,401	0.0%	-	1,401	25%	1,751	5,400	0.26	0.32	A	A
	Hwy 405	RR 55	3,714	441	4,155	0.0%	-	4,155	38%	5,734	5,400	0.77	1.06	C	F
	RR 55	Ontario Street	3,714	441	4,155	0.0%	-	4,155	38%	5,734	4,500	0.92	1.27	E	F
	Ontario Street	Hwy 406	3,613	376	3,989	0.0%	-	3,989	38%	5,504	5,400	0.74	1.02	C	F
	Hwy 406	Fruitland	4,329	469	4,799	0.0%	-	4,799	25%	5,998	5,400	0.89	1.11	D	F
	Fruitland	Hwy 20	4,145	518	4,663	0.0%	-	4,663	3%	4,803	5,400	0.86	0.89	D	D
	Hwy 20	Hwy 403	5,243	540	5,784	0.0%	-	5,784	3%	5,957	6,000	0.96	0.99	E	E
Hwy 403	Brantford	Hwy 2	1,265	-	1,265	15.0%	190	1,455	3%	1,499	2,400	0.61	0.62	B	B
	Hwy 2	RHC Express.	2,735	48	2,783	15.0%	410	3,194	3%	3,289	3,600	0.89	0.91	D	E
	RHC Express.	Aberdeen	3,446	48	3,494	15.0%	517	4,011	3%	4,131	3,600	1.11	1.15	F	F
	Aberdeen	Hwy 6	6,528	116	6,644	0.0%	-	6,644	3%	6,844	6,000	1.11	1.14	F	F
	Hwy 6	QEW	6,578	91	6,669	0.0%	-	6,669	3%	6,869	5,400	1.23	1.27	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,477	1	1,478	6.5%	96	1,574	3%	1,621	1,600	0.98	1.01	E	F
	Rymal Rd	RHC Express.	1,179	1	1,180	6.5%	77	1,257	3%	1,294	1,600	0.79	0.81	C	D
	RHC Express.	Claremont	1,579	1	1,580	6.5%	103	1,682	3%	1,733	2,000	0.84	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	322	-	322	12.0%	39	361	3%	371	2,400	0.15	0.15	A	A
	Fiddlers Green	Hwy 6	609	-	609	12.0%	73	682	3%	703	1,200	0.57	0.59	B	B
	Hwy 6	Hwy 56	938	-	938	12.0%	113	1,050	3%	1,082	2,400	0.44	0.45	A	A
Hwy 20	QEW	Queenston	2,036	166	2,201	0.0%	-	2,201	25%	2,751	1,600	1.38	1.72	F	F
	Queenston	Mud St	2,256	-	2,256	0.0%	-	2,256	25%	2,820	1,600	1.41	1.76	F	F
	Mud St	Hwy 53	1,428	9	1,436	0.0%	-	1,436	25%	1,795	2,400	0.60	0.75	B	C
	Hwy 53	RR 27	676	9	685	7.0%	47	732	25%	915	2,400	0.31	0.38	A	A
	RR 27	Fonthill	489	-	489	7.0%	34	524	25%	654	900	0.58	0.73	B	C
	Fonthill	Hwy 406	938	-	938	7.0%	66	1,004	25%	1,255	1,800	0.56	0.70	B	C
	Hwy 406	Hwy 58	549	-	549	7.0%	38	588	25%	735	900	0.65	0.82	C	D
	Hwy 58	Montrose Rd	1,094	-	1,094	7.0%	77	1,171	25%	1,463	1,600	0.73	0.91	C	E
Hwy 405	QEW	Q-L Bridge	1,989	299	2,288	0.0%	-	2,288	38%	3,157	3,600	0.64	0.88	B	D
Hwy 420	QEW	Stanley Ave	2,235	78	2,313	0.0%	-	2,313	25%	2,891	3,600	0.64	0.80	B	D
Hwy 58	Hwy 406	Hwy 3	456	28	483	0.0%	-	483	3%	498	900	0.54	0.55	B	B
Hwy 140	Welland	Hwy 3	443	-	443	7.0%	31	474	3%	489	800	0.59	0.61	B	B
Hwy 3	Fort Erie	Hwy 140	675	-	675	4.5%	30	706	3%	727	1,800	0.39	0.40	A	A
	Hwy140	Hwy 58	151	-	151	4.5%	7	158	3%	163	900	0.18	0.18	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,180	83	1,262	0.0%	-	1,262	3%	1,300	2,400	0.53	0.54	B	B
	Hwy 20	Hwy 58	2,037	18	2,055	0.0%	-	2,055	3%	2,117	2,400	0.86	0.88	D	D
	Hwy 58	Geneva St	2,653	7	2,659	0.0%	-	2,659	3%	2,739	2,400	1.11	1.14	F	F
	Geneva St	QEW	1,042	86	1,128	0.0%	-	1,128	3%	1,162	2,400	0.47	0.48	A	A
RHC Expressway	QEW	Barton	2,951	-	2,951	0.0%	-	2,951	3%	3,040	2,400	1.23	1.27	F	F
	Barton	Queensway	2,921	46	2,967	0.0%	-	2,967	3%	3,056	2,400	1.24	1.27	F	F
	Queensway	King	3,297	46	3,344	0.0%	-	3,344	3%	3,444	2,400	1.39	1.44	F	F
	King	Mud St	3,912	46	3,959	0.0%	-	3,959	3%	4,077	2,400	1.65	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ Hwy 420 extension
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,785	319	2,104	0.0%	-	2,104	25%	2,630	3,600	0.58	0.73	B	C
	Hwy 420	Hwy 405	3,525	301	3,825	0.0%	-	3,825	25%	4,782	7,200	0.53	0.66	B	C
	Hwy 405	RR 55	4,881	201	5,082	0.0%	-	5,082	38%	7,013	7,200	0.71	0.97	C	E
	RR 55	Ontario Street	4,881	201	5,082	0.0%	-	5,082	38%	7,013	6,000	0.85	1.17	D	F
	Ontario Street	Hwy 406	4,434	175	4,609	0.0%	-	4,609	38%	6,360	7,200	0.64	0.88	B	D
	Hwy 406	Fruitland	5,098	227	5,325	0.0%	-	5,325	25%	6,656	7,200	0.74	0.92	C	E
	Fruitland	Hwy 20	4,514	259	4,773	0.0%	-	4,773	3%	4,916	7,200	0.66	0.68	C	C
	Hwy 20	Hwy 403	5,950	293	6,243	0.0%	-	6,243	3%	6,430	6,000	1.04	1.07	F	F
Hwy 403	Brantford	Hwy 2	1,254	-	1,254	15.0%	188	1,442	3%	1,485	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,919	74	2,993	15.0%	438	3,431	3%	3,534	3,600	0.95	0.98	E	E
	RHC Express.	Aberdeen	3,784	3	3,787	15.0%	568	4,355	3%	4,485	3,600	1.21	1.25	F	F
	Aberdeen	Hwy 6	6,590	112	6,702	0.0%	-	6,702	3%	6,903	6,000	1.12	1.15	F	F
	Hwy 6	QEW	6,985	194	7,179	0.0%	-	7,179	3%	7,394	5,400	1.33	1.37	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,478	-	1,478	6.5%	96	1,574	3%	1,621	1,600	0.98	1.01	E	F
	Rymal Rd	RHC Express.	1,243	-	1,243	6.5%	81	1,324	3%	1,364	1,600	0.83	0.85	D	D
	RHC Express.	Claremont	1,589	-	1,589	6.5%	103	1,693	3%	1,743	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	311	-	311	12.0%	37	349	3%	359	2,400	0.15	0.15	A	A
	Fiddlers Green	Hwy 6	651	-	651	12.0%	78	729	3%	751	1,200	0.61	0.63	B	B
	Hwy 6	Hwy 56	963	-	963	12.0%	116	1,078	3%	1,111	2,400	0.45	0.46	A	A
Hwy 20	QEW	Queenston	2,129	192	2,321	0.0%	-	2,321	25%	2,901	1,600	1.45	1.81	F	F
	Queenston	Mud St	2,206	-	2,206	0.0%	-	2,206	25%	2,758	1,600	1.38	1.72	F	F
	Mud St	Hwy 53	1,254	12	1,267	0.0%	-	1,267	25%	1,583	2,400	0.53	0.66	B	C
	Hwy 53	RR 27	959	12	971	7.0%	67	1,038	25%	1,298	2,400	0.43	0.54	A	B
	RR 27	Fonthill	332	3	335	7.0%	23	359	25%	448	900	0.40	0.50	A	A
	Fonthill	Hwy 406	1,223	9	1,232	7.0%	86	1,317	25%	1,647	1,800	0.73	0.91	C	E
	Hwy 406	Hwy 58	961	9	970	7.0%	67	1,037	25%	1,296	900	1.15	1.44	F	F
	Hwy 58	Montrose Rd	1,426	-	1,426	7.0%	100	1,525	25%	1,907	1,600	0.95	1.19	E	F
Hwy 405	QEW	Q-L Bridge	1,548	192	1,740	0.0%	-	1,740	38%	2,401	3,600	0.48	0.67	A	C
Hwy 420	QEW	Stanley Ave	2,282	39	2,321	0.0%	-	2,321	25%	2,901	3,600	0.64	0.81	B	D
Hwy 58	Hwy 406	Hwy 3	437	1	438	0.0%	-	438	3%	451	900	0.49	0.50	A	B
Hwy 140	Welland	Hwy 3	430	-	430	7.0%	30	460	3%	474	800	0.58	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	778	-	778	4.5%	35	813	3%	837	1,800	0.45	0.47	A	A
	Hwy140	Hwy 58	180	-	180	4.5%	8	188	3%	194	900	0.21	0.22	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,184	30	1,214	0.0%	-	1,214	3%	1,250	2,400	0.51	0.52	B	B
	Hwy 20	Hwy 58	2,058	30	2,087	0.0%	-	2,087	3%	2,150	2,400	0.87	0.90	D	D
	Hwy 58	Geneva St	2,706	40	2,746	0.0%	-	2,746	3%	2,829	2,400	1.14	1.18	F	F
	Geneva St	QEW	1,138	44	1,183	0.0%	-	1,183	3%	1,218	2,400	0.49	0.51	A	B
RHC Expressway	QEW	Barton	3,704	-	3,704	0.0%	-	3,704	3%	3,815	2,400	1.54	1.59	F	F
	Barton	Queensway	3,391	3	3,394	0.0%	-	3,394	3%	3,496	2,400	1.41	1.46	F	F
	Queensway	King	3,706	3	3,709	0.0%	-	3,709	3%	3,820	2,400	1.55	1.59	F	F
	King	Mud St	4,129	3	4,132	0.0%	-	4,132	3%	4,256	2,400	1.72	1.77	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ 8 lane QEW and Hwy 420 extension
High Tourist Condition
Year 2031 - Volumes

	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
Facility	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,790	321	2,111	0.0%	-	2,111	25%	2,639	3,600	0.59	0.73	B	C
	Hwy 420	Hwy 405	3,925	304	4,229	0.0%	-	4,229	25%	5,286	7,200	0.59	0.73	B	C
	Hwy 405	RR 55	5,730	523	6,253	0.0%	-	6,253	38%	8,629	7,200	0.87	1.20	D	F
	RR 55	Ontario Street	5,730	523	6,253	0.0%	-	6,253	38%	8,629	6,000	1.04	1.44	F	F
	Ontario Street	Hwy 406	5,359	494	5,854	0.0%	-	5,854	38%	8,078	7,200	0.81	1.12	D	F
	Hwy 406	Fruitland	6,150	606	6,757	0.0%	-	6,757	25%	8,446	7,200	0.94	1.17	E	F
	Fruitland	Hwy 20	5,541	688	6,228	0.0%	-	6,228	3%	6,415	7,200	0.87	0.89	D	D
	Hwy 20	Hwy 403	6,373	675	7,047	0.0%	-	7,047	3%	7,259	6,000	1.17	1.21	F	F
Hwy 403	Brantford	Hwy 2	1,274	-	1,274	15.0%	191	1,465	3%	1,509	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,913	106	3,019	15.0%	437	3,456	3%	3,560	3,600	0.96	0.99	E	E
	RHC Express.	Aberdeen	3,829	41	3,870	15.0%	574	4,444	3%	4,578	3,600	1.23	1.27	F	F
	Aberdeen	Hwy 6	7,075	92	7,167	0.0%	-	7,167	3%	7,382	6,000	1.19	1.23	F	F
	Hwy 6	QEW	7,172	112	7,284	0.0%	-	7,284	3%	7,502	5,400	1.35	1.39	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,525	-	1,525	6.5%	99	1,625	3%	1,673	1,600	1.02	1.05	F	F
	Rymal Rd	RHC Express.	1,216	-	1,216	6.5%	79	1,295	3%	1,334	1,600	0.81	0.83	D	D
	RHC Express.	Claremont	1,584	-	1,584	6.5%	103	1,687	3%	1,738	2,000	0.84	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	306	-	306	12.0%	37	343	3%	353	2,400	0.14	0.15	A	A
	Fiddlers Green	Hwy 6	692	-	692	12.0%	83	775	3%	798	1,200	0.65	0.66	B	C
	Hwy 6	Hwy 56	1,025	-	1,025	12.0%	123	1,148	3%	1,182	2,400	0.48	0.49	A	A
Hwy 20	QEW	Queenston	2,068	169	2,238	0.0%	-	2,238	25%	2,797	1,600	1.40	1.75	F	F
	Queenston	Mud St	2,246	-	2,246	0.0%	-	2,246	25%	2,808	1,600	1.40	1.75	F	F
	Mud St	Hwy 53	1,296	13	1,308	0.0%	-	1,308	25%	1,635	2,400	0.55	0.68	B	C
	Hwy 53	RR 27	655	13	668	7.0%	46	714	25%	892	2,400	0.30	0.37	A	A
	RR 27	Fonthill	344	4	348	7.0%	24	372	25%	465	900	0.41	0.52	A	B
	Fonthill	Hwy 406	1,222	4	1,226	7.0%	86	1,311	25%	1,639	1,800	0.73	0.91	C	E
	Hwy 406	Hwy 58	941	5	946	7.0%	66	1,012	25%	1,265	900	1.12	1.41	F	F
	Hwy 58	Montrose Rd	1,382	-	1,382	7.0%	97	1,478	25%	1,848	1,600	0.92	1.15	E	F
Hwy 405	QEW	Q-L Bridge	1,969	219	2,188	0.0%	-	2,188	38%	3,020	3,600	0.61	0.84	B	D
Hwy 420	QEW	Stanley Ave	2,287	44	2,331	0.0%	-	2,331	25%	2,914	3,600	0.65	0.81	B	D
Hwy 58	Hwy 406	Hwy 3	461	-	461	0.0%	-	461	3%	475	900	0.51	0.53	B	B
Hwy 140	Welland	Hwy 3	427	-	427	7.0%	30	456	3%	470	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	776	-	776	4.5%	35	810	3%	835	1,800	0.45	0.46	A	A
	Hwy140	Hwy 58	177	-	177	4.5%	8	185	3%	191	900	0.21	0.21	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,176	0	1,177	0.0%	-	1,177	3%	1,212	2,400	0.49	0.51	A	B
	Hwy 20	Hwy 58	2,002	0	2,002	0.0%	-	2,002	3%	2,062	2,400	0.83	0.86	D	D
	Hwy 58	Geneva St	2,560	38	2,597	0.0%	-	2,597	3%	2,675	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,038	140	1,178	0.0%	-	1,178	3%	1,213	2,400	0.49	0.51	A	B
RHC Expressway	QEW	Barton	3,368	2	3,370	0.0%	-	3,370	3%	3,471	2,400	1.40	1.45	F	F
	Barton	Queensway	3,221	41	3,263	0.0%	-	3,263	3%	3,360	2,400	1.36	1.40	F	F
	Queensway	King	3,544	41	3,585	0.0%	-	3,585	3%	3,693	2,400	1.49	1.54	F	F
	King	Mud St	4,019	41	4,060	0.0%	-	4,060	3%	4,182	2,400	1.69	1.74	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
Corridor Assessment
Revised Base Network w\ 8 lane QEW
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,778	327	2,106	0.0%	-	2,106	25%	2,632	3,600	0.58	0.73	B	C
	Hwy 420	Hwy 405	3,903	338	4,241	0.0%	-	4,241	25%	5,301	7,200	0.59	0.74	B	C
	Hwy 405	RR 55	5,450	559	6,009	0.0%	-	6,009	38%	8,293	7,200	0.83	1.15	D	F
	RR 55	Ontario Street	5,450	559	6,009	0.0%	-	6,009	38%	8,293	6,000	1.00	1.38	F	F
	Ontario Street	Hwy 406	5,376	500	5,876	0.0%	-	5,876	38%	8,108	7,200	0.82	1.13	D	F
	Hwy 406	Fruitland	6,133	612	6,745	0.0%	-	6,745	25%	8,431	7,200	0.94	1.17	E	F
	Fruitland	Hwy 20	5,521	695	6,217	0.0%	-	6,217	3%	6,403	7,200	0.86	0.89	D	D
	Hwy 20	Hwy 403	5,618	661	6,279	0.0%	-	6,279	3%	6,467	6,000	1.05	1.08	F	F
Hwy 403	Brantford	Hwy 2	1,186	-	1,186	15.0%	178	1,363	3%	1,404	2,400	0.57	0.59	B	B
	Hwy 2	RHC Express.	2,593	189	2,783	15.0%	389	3,172	3%	3,267	3,600	0.88	0.91	D	E
	RHC Express.	Aberdeen	3,396	128	3,523	15.0%	509	4,033	3%	4,154	3,600	1.12	1.15	F	F
	Aberdeen	Hwy 6	7,324	75	7,400	0.0%	-	7,400	3%	7,622	6,000	1.23	1.27	F	F
	Hwy 6	QEW	7,528	54	7,583	0.0%	-	7,583	3%	7,810	5,400	1.40	1.45	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,526	-	1,526	6.5%	99	1,626	3%	1,674	1,600	1.02	1.05	F	F
	Rymal Rd	RHC Express.	1,217	-	1,217	6.5%	79	1,296	3%	1,335	1,600	0.81	0.83	D	D
	RHC Express.	Claremont	1,618	-	1,618	6.5%	105	1,723	3%	1,775	2,000	0.86	0.89	D	D
Hwy 53	Hwy 2	Fiddlers Green	227	-	227	12.0%	27	254	3%	261	2,400	0.11	0.11	A	A
	Fiddlers Green	Hwy 6	741	-	741	12.0%	89	829	3%	854	1,200	0.69	0.71	C	C
	Hwy 6	Hwy 56	1,013	-	1,013	12.0%	122	1,135	3%	1,169	2,400	0.47	0.49	A	A
Hwy 20	QEW	Queenston	2,083	165	2,249	0.0%	-	2,249	25%	2,811	1,600	1.41	1.76	F	F
	Queenston	Mud St	2,250	-	2,250	0.0%	-	2,250	25%	2,812	1,600	1.41	1.76	F	F
	Mud St	Hwy 53	1,276	11	1,287	0.0%	-	1,287	25%	1,608	2,400	0.54	0.67	B	C
	Hwy 53	RR 27	726	11	737	7.0%	51	788	25%	985	2,400	0.33	0.41	A	A
	RR 27	Fonthill	352	5	357	7.0%	25	382	25%	477	900	0.42	0.53	A	B
	Fonthill	Hwy 406	1,168	1	1,170	7.0%	82	1,251	25%	1,564	1,800	0.70	0.87	C	D
	Hwy 406	Hwy 58	948	1	949	7.0%	66	1,015	25%	1,269	900	1.13	1.41	F	F
	Hwy 58	Montrose Rd	1,515	-	1,515	7.0%	106	1,621	25%	2,026	1,600	1.01	1.27	F	F
Hwy 405	QEW	Q-L Bridge	1,980	221	2,201	0.0%	-	2,201	38%	3,037	3,600	0.61	0.84	B	D
Hwy 420	QEW	Stanley Ave	2,258	43	2,301	0.0%	-	2,301	25%	2,877	3,600	0.64	0.80	B	C
Hwy 58	Hwy 406	Hwy 3	450	-	450	0.0%	-	450	3%	463	900	0.50	0.51	A	B
Hwy 140	Welland	Hwy 3	427	-	427	7.0%	30	457	3%	470	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	769	-	769	4.5%	35	803	3%	827	1,800	0.45	0.46	A	A
	Hwy140	Hwy 58	179	-	179	4.5%	8	187	3%	193	900	0.21	0.21	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,228	0	1,228	0.0%	-	1,228	3%	1,265	2,400	0.51	0.53	B	B
	Hwy 20	Hwy 58	1,988	0	1,988	0.0%	-	1,988	3%	2,048	2,400	0.83	0.85	D	D
	Hwy 58	Geneva St	2,601	7	2,608	0.0%	-	2,608	3%	2,687	2,400	1.09	1.12	F	F
	Geneva St	QEW	1,082	141	1,223	0.0%	-	1,223	3%	1,260	2,400	0.51	0.52	B	B
RHC Expressway	QEW	Barton	3,101	73	3,174	0.0%	-	3,174	3%	3,269	2,400	1.32	1.36	F	F
	Barton	Queensway	2,915	128	3,043	0.0%	-	3,043	3%	3,134	2,400	1.27	1.31	F	F
	Queensway	King	3,277	128	3,405	0.0%	-	3,405	3%	3,507	2,400	1.42	1.46	F	F
	King	Mud St	3,825	128	3,952	0.0%	-	3,952	3%	4,071	2,400	1.65	1.70	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

APPENDIX K
MPC VOLUME FORECASTS

MTO - Niagara Needs Assessment
MPC Facility Assessment
Year 2021 - Revised Base Network w\ MPC Alt.C
PM Peak Hour Volumes

Facility	Section		Eastbound								Westbound							
			# of	Length	Capacity	Assigned Volume					# of	Length	Capacity	Assigned Volume				
	From	To	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS
MPC	QEW	Hwy 140	2	0.75	1,800	937	337	1,274	0.35	A	2	0.83	1,800	893	251	1,144	0.32	A
	Hwy 140	Hwy 58	2	4.13	1,800	1,280	378	1,658	0.46	A	2	4.14	1,800	1,031	273	1,303	0.36	A
	Hwy 58	RR 24	2	9.57	1,800	1,223	433	1,657	0.46	A	2	9.56	1,800	821	369	1,190	0.33	A
	RR 24	Hwy 56	2	6.34	1,800	1,091	459	1,550	0.43	A	2	6.26	1,800	759	430	1,188	0.33	A
	Hwy 56	Hwy 6	2	9.53	1,800	2,114	427	2,541	0.71	C	2	9.53	1,800	584	372	956	0.27	A
	Hwy 6	Hwy 403	2	6.61	1,800	1,895	354	2,248	0.62	B	2	6.6	1,800	334	327	661	0.18	A
	Hwy 403	Hwy 8	2	6.66	1,800	2,962	369	3,330	0.93	E	2	6.67	1,800	594	435	1,029	0.29	A
	Hwy 8	Hwy 6	2	1.71	1,800	2,615	123	2,738	0.76	C	2	1.41	1,800	288	166	454	0.13	A
	Hwy 6	Hwy 407	2	10.46	1,800	2,939	60	2,999	0.83	D	2	10.92	1,800	366	161	527	0.15	A

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
MPC Facility Assessment
Year 2031 - Revised Base Network w\ MPC Alt.C
PM Peak Hour Volumes

Facility	Section		Eastbound								Westbound							
			# of	Length	Capacity	Assigned Volume					# of	Length	Capacity	Assigned Volume				
	From	To	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS
MPC	QEW	Hwy 140	2	0.75	1,800	1,019	367	1,386	0.39	A	2	0.83	1,800	934	321	1,255	0.35	A
	Hwy 140	Hwy 58	2	4.13	1,800	1,555	404	1,958	0.54	B	2	4.14	1,800	1,195	377	1,572	0.44	A
	Hwy 58	RR 24	2	9.57	1,800	1,500	472	1,972	0.55	B	2	9.56	1,800	994	472	1,465	0.41	A
	RR 24	Hwy 56	2	6.34	1,800	1,375	495	1,870	0.52	B	2	6.26	1,800	937	563	1,500	0.42	A
	Hwy 56	Hwy 6	2	9.53	1,800	2,398	461	2,859	0.79	C	2	9.53	1,800	773	499	1,272	0.35	A
	Hwy 6	Hwy 403	2	6.61	1,800	2,102	430	2,532	0.70	C	2	6.6	1,800	472	452	923	0.26	A
	Hwy 403	Hwy 8	2	6.66	1,800	3,027	452	3,480	0.97	E	2	6.67	1,800	769	593	1,361	0.38	A
	Hwy 8	Hwy 6	2	1.71	1,800	2,723	122	2,845	0.79	C	2	1.41	1,800	494	229	723	0.20	A
	Hwy 6	Hwy 407	2	10.46	1,800	3,065	73	3,138	0.87	D	2	10.92	1,800	585	226	811	0.23	A

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
MPC Facility Assessment
Year 2021 - Revised Base Network w\ MPC Alt.C and 8 lane QEW
PM Peak Hour Volumes

Facility	Section		Eastbound								Westbound							
			# of	Length	Capacity	Assigned Volume					# of	Length	Capacity	Assigned Volume				
	From	To	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS
MPC	QEW	Hwy 140	2	0.75	1,800	720	203	922	0.26	A	2	0.83	1,800	660	156	816	0.23	A
	Hwy 140	Hwy 58	2	4.13	1,800	797	217	1,014	0.28	A	2	4.14	1,800	669	105	774	0.22	A
	Hwy 58	RR 24	2	9.57	1,800	753	278	1,031	0.29	A	2	9.56	1,800	481	187	668	0.19	A
	RR 24	Hwy 56	2	6.34	1,800	604	289	893	0.25	A	2	6.26	1,800	423	224	647	0.18	A
	Hwy 56	Hwy 6	2	9.53	1,800	1,796	274	2,069	0.57	B	2	9.53	1,800	445	177	623	0.17	A
	Hwy 6	Hwy 403	2	6.61	1,800	1,675	274	1,949	0.54	B	2	6.6	1,800	255	167	422	0.12	A
	Hwy 403	Hwy 8	2	6.66	1,800	2,888	323	3,211	0.89	D	2	6.67	1,800	526	303	829	0.23	A
	Hwy 8	Hwy 6	2	1.71	1,800	2,573	83	2,656	0.74	C	2	1.41	1,800	245	44	289	0.08	A
	Hwy 6	Hwy 407	2	10.46	1,800	3,028	9	3,037	0.84	D	2	10.92	1,800	332	40	373	0.10	A

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara Needs Assessment
MPC Facility Assessment
Year 2031 - Revised Base Network w\ MPC Alt.C and 8 lane QEW
PM Peak Hour Volumes

Facility	Section		Eastbound								Westbound							
			# of	Length	Capacity	Assigned Volume					# of	Length	Capacity	Assigned Volume				
	From	To	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS	Lanes	(km)	(vpl)	Auto	Trucks	otal Volum	V/C	LOS
MPC	QEW	Hwy 140	2	0.75	1,800	849	284	1,133	0.31	A	2	0.83	1,800	732	273	1,005	0.28	A
	Hwy 140	Hwy 58	2	4.13	1,800	1,017	336	1,353	0.38	A	2	4.14	1,800	779	243	1,022	0.28	A
	Hwy 58	RR 24	2	9.57	1,800	933	442	1,376	0.38	A	2	9.56	1,800	585	336	922	0.26	A
	RR 24	Hwy 56	2	6.34	1,800	779	454	1,233	0.34	A	2	6.26	1,800	534	409	944	0.26	A
	Hwy 56	Hwy 6	2	9.53	1,800	2,039	429	2,468	0.69	C	2	9.53	1,800	551	384	935	0.26	A
	Hwy 6	Hwy 403	2	6.61	1,800	1,860	424	2,284	0.63	B	2	6.6	1,800	339	351	690	0.19	A
	Hwy 403	Hwy 8	2	6.66	1,800	2,963	480	3,443	0.96	E	2	6.67	1,800	642	516	1,158	0.32	A
	Hwy 8	Hwy 6	2	1.71	1,800	2,672	56	2,728	0.76	C	2	1.41	1,800	378	151	529	0.15	A
	Hwy 6	Hwy 407	2	10.46	1,800	3,070	1	3,072	0.85	D	2	10.92	1,800	541	147	689	0.19	A

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

APPENDIX K
NETWORK PERFORMANCE

Niagara Needs Assessment
Network Performance Indicators
2031 High Condition

Niagara - MTO Facilities

Total Network Condition Characteristics	Base Network	Rev. Base with 8 Lane QEW	Rev. Base with 10 Lane QEW	Rev. Base with Hwy 420 ext	Rev. Base with MPC Alt. A	Rev. Base with MPC Alt. B	Rev. Base with MPC Alt. C	Rev. Base w\ MPC Alt.C Tolled- $0.04	Rev. Base w\ MPC Alt.C Tolled- $0.10	Rev. Base with MPC Alt. D	Rev. Base with MPC Alt D2	Rev. Base with MPC Alt. E	Rev. Base with MPC Alt. F	Rev. Base with MPC Alt. G	Rev. Base w\ MPC Alt.C 8 lane QEW	Rev. Base with Bridge
System Travel (Veh-Km)	891,088	966,564	1,023,955	848,353	986,067	1,002,733	1,014,986	1,013,921	898,125	1,020,311	1,006,019	1,018,928	879,014	920,396	1,047,362	815,418
System Travel Time (Veh-Hrs)	14,990	14,539	14,703	13,137	14,235	14,255	14,412	14,422	15,365	14,272	14,129	14,188	14,130	15,907	14,269	12,512
Average System Speed (km/h)	59.4	66.5	69.6	64.6	69.3	70.3	70.4	70.3	58.5	71.5	71.2	71.8	62.2	57.9	73.4	65.2
Km of Roadway	517.5	517.5	517.5	522.7	646.9	644.5	646.9	646.9	646.9	626.2	611.0	622.0	519.1	517.5	646.9	517.5
Km Exceeding Volume/Capacity of 1.0	61	38	14	41	46	44	46	46	70	19	19	18	49	74	16	19
% Exceeding Capacity	11.8%	7.3%	2.7%	7.9%	7.1%	6.8%	7.1%	7.2%	10.9%	3.0%	3.1%	2.9%	9.4%	14.4%	2.5%	3.7%

Niagara - Regional Facilities

Total Network Condition Characteristics	Base Network	Rev. Base with 8 Lane QEW	Rev. Base with 10 Lane QEW	Rev. Base with Hwy 420	Rev. Base with MPC Alt. A	Rev. Base with MPC Alt. B	Rev. Base with MPC Alt. C	Rev. Base w\ MPC Alt.C Tolled- $0.04	Rev. Base w\ MPC Alt.C Tolled- $0.10	Rev. Base with MPC Alt. D	Rev. Base with MPC Alt D2	Rev. Base with MPC Alt. E	Rev. Base with MPC Alt. F	Rev. Base with MPC Alt. G	Rev. Base w\ MPC Alt.C 8 lane QEW	Rev. Base with Bridge
System Travel (Veh-Km)	867,227	764,055	701,458	791,544	782,443	773,232	759,533	761,778	849,957	731,556	710,892	717,912	770,008	834,941	700,186	843,254
System Travel Time (Veh-Hrs)	18,753	15,789	14,294	16,804	16,382	16,127	15,799	15,861	18,173	15,096	14,687	14,848	16,051	17,845	14,312	18,138
Average System Speed (km/h)	46.2	48.4	49.1	47.1	47.8	47.9	48.1	48.0	46.8	48.5	48.4	48.4	48.0	46.8	48.9	46.5
Km of Roadway	2,403.5	2,392.1	2,392.1	2,392.1	2,392.1	2,392.1	2,392.1	2,392.1	2,392.1	2,373.1	2,360.2	2,362.3	2,392.1	2,392.1	2,392.1	2,392.1
Km Exceeding Volume/Capacity of 1.0	194	129	121	165	140	137	136	136	173	123	122	124	142	178	121	172
% Exceeding Capacity	8.1%	5.4%	5.0%	6.9%	5.9%	5.7%	5.7%	5.7%	7.2%	5.2%	5.2%	5.2%	6.0%	7.5%	5.1%	7.2%

Hamilton - MTO Facilities

Total Network Condition Characteristics	Base Network	Rev. Base with 8 Lane QEW	Rev. Base with 10 Lane QEW	Rev. Base with Hwy 420	Rev. Base with MPC Alt. A	Rev. Base with MPC Alt. B	Rev. Base with MPC Alt. C	Rev. Base w\ MPC Alt.C Tolled- $0.04	Rev. Base w\ MPC Alt.C Tolled- $0.10	Rev. Base with MPC Alt. D	Rev. Base with MPC Alt D2	Rev. Base with MPC Alt. E	Rev. Base with MPC Alt. F	Rev. Base with MPC Alt. G	Rev. Base w\ MPC Alt.C 8 lane QEW	Rev. Base with Bridge
System Travel (Veh-Km)	541,078	552,453	571,324	500,212	600,276	593,820	661,781	662,168	563,003	648,649	653,960	648,892	535,890	605,223	658,360	502,007
System Travel Time (Veh-Hrs)	10,044	9,835	9,756	8,272	9,851	9,877	10,251	10,266	10,157	9,962	10,039	9,988	9,237	10,105	9,926	8,464
Average System Speed (km/h)	53.9	56.2	58.6	60.5	60.9	60.1	64.6	64.5	55.4	65.1	65.1	65.0	58.0	59.9	66.3	59.3
Km of Roadway	245.5	245.5	241.3	241.3	300.7	290.8	325.4	325.4	325.4	325.4	325.4	325.4	241.3	297.3	325.4	241.3
Km Exceeding Volume/Capacity of 1.0	40	33	29	26	29	33	26	26	36	26	26	25	36	36	24	25
% Exceeding Capacity	16.4%	13.4%	12.2%	10.8%	9.7%	11.5%	8.1%	7.9%	11.2%	7.9%	7.9%	7.7%	15.1%	12.0%	7.4%	10.5%

Hamilton - Regional Facilities

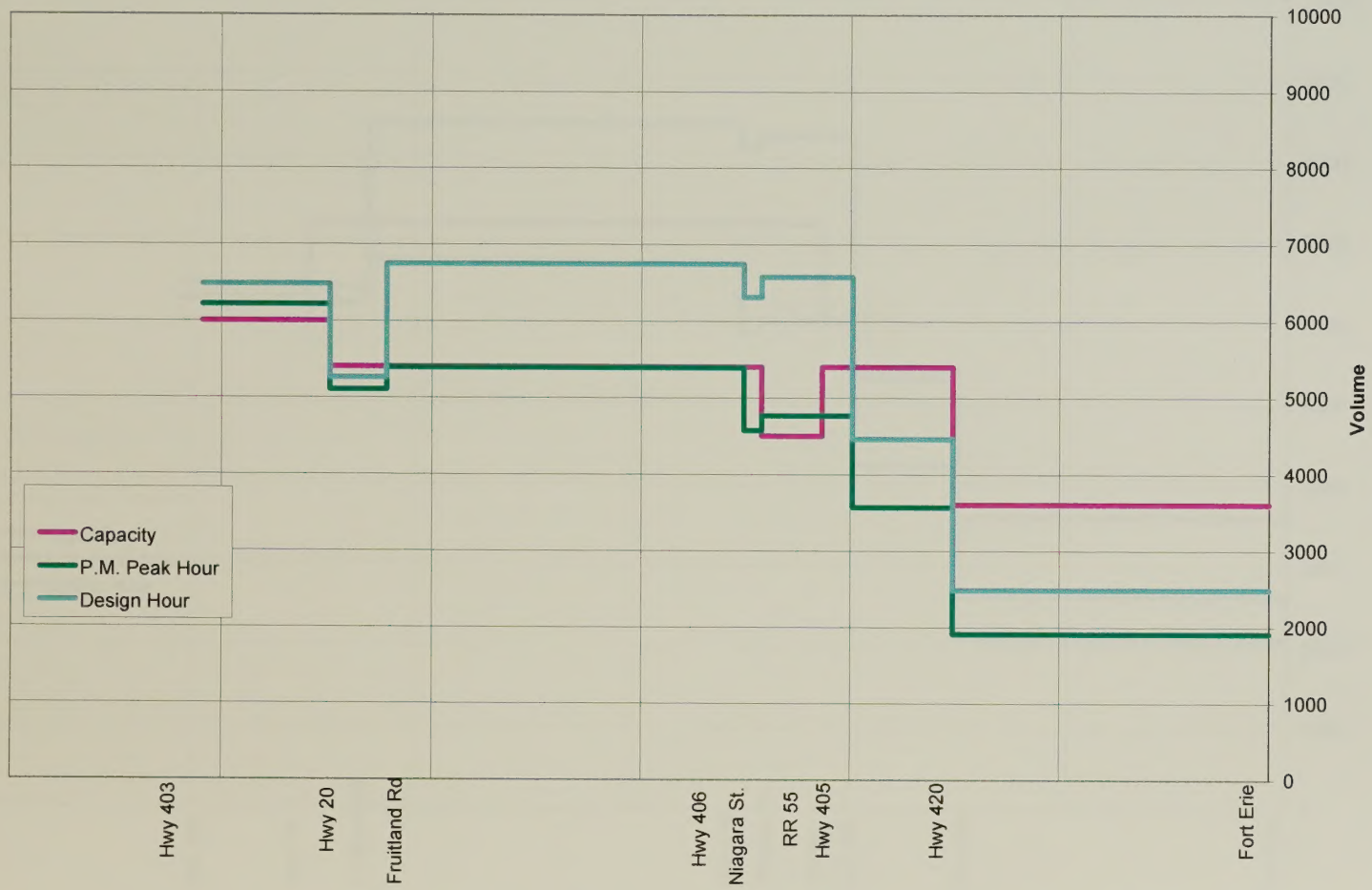
Total Network Condition Characteristics	Base Network	Rev. Base with 8 Lane QEW	Rev. Base with 10 Lane QEW	Rev. Base with Hwy 420	Rev. Base with MPC Alt. A	Rev. Base with MPC Alt. B	Rev. Base with MPC Alt. C	Rev. Base w\ MPC Alt.C Tolled- $0.04	Rev. Base w\ MPC Alt.C Tolled- $0.10	Rev. Base with MPC Alt. D	Rev. Base with MPC Alt D2	Rev. Base with MPC Alt. E	Rev. Base with MPC Alt. F	Rev. Base with MPC Alt. G	Rev. Base w\ MPC Alt.C 8 lane QEW	Rev. Base with Bridge
System Travel (Veh-Km)	842,325	805,656	767,571	739,188	800,393	796,530	730,543	729,897	793,808	740,704	739,870	739,025	715,149	752,849	716,828	778,402
System Travel Time (Veh-Hrs)	17,128	16,081	15,047	14,273	15,913	15,941	14,040	14,024	15,761	14,276	14,258	14,248	13,847	14,764	13,698	15,197
Average System Speed (km/h)	49.2	50.1	51.0	51.8	50.3	50.0	52.0	52.0	50.4	51.9	51.9	51.9	51.6	51.0	52.3	51.2
Km of Roadway	1,627.2	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0	1,623.0
Km Exceeding Volume/Capacity of 1.0	98	86	59	63	82	89	63	63	82	63	63	61	51	69	59	74
% Exceeding Capacity	6.0%	5.3%	3.6%	3.9%	5.1%	5.5%	3.9%	3.9%	5.0%	3.9%	3.9%	3.7%	3.1%	4.3%	3.6%	4.5%

All Niagara/Hamilton Facilities

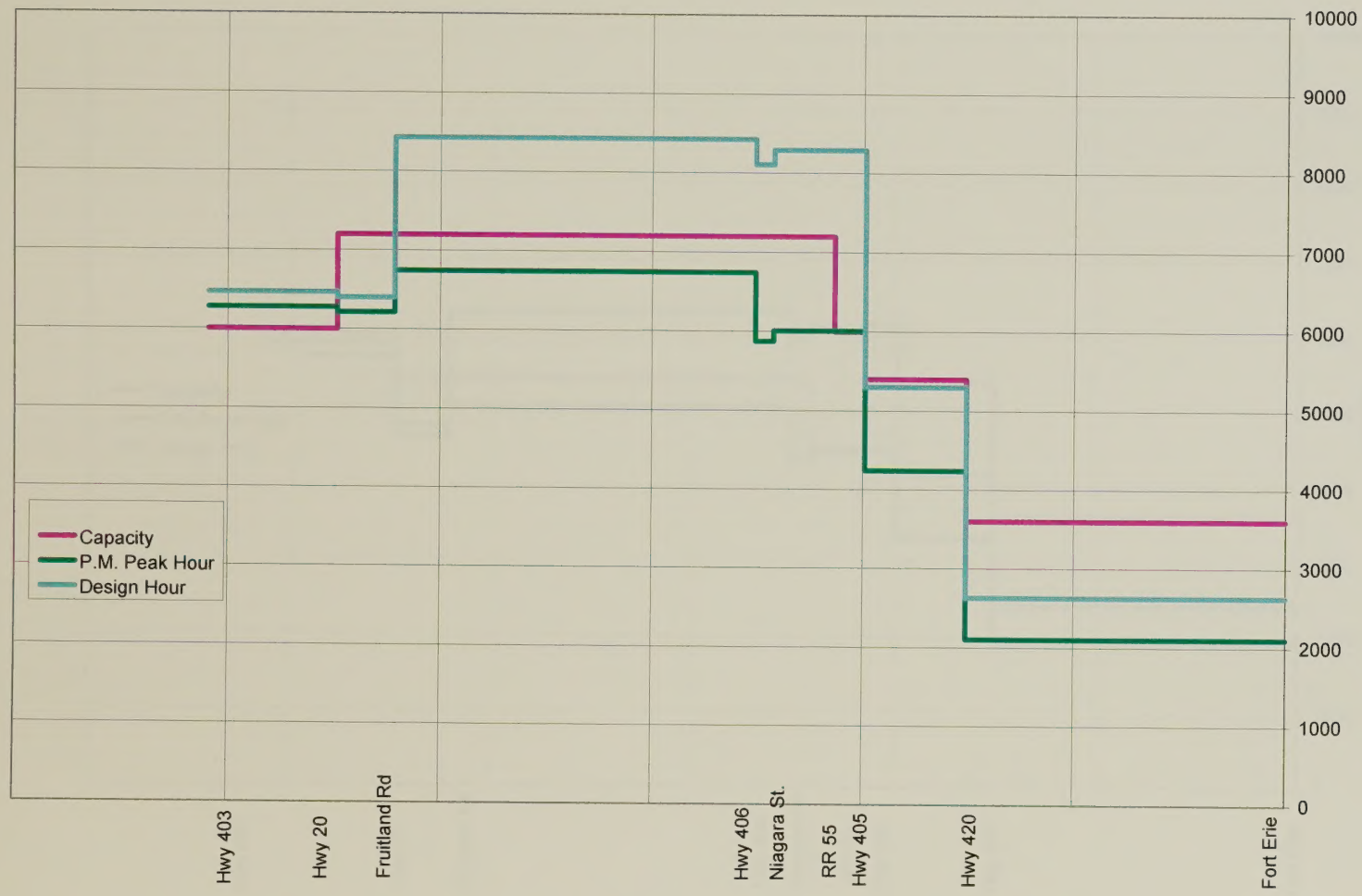
Total Network Condition Characteristics	Base Network	Rev. Base with 8 Lane QEW	Rev. Base with 10 Lane QEW	Rev. Base with Hwy 420	Rev. Base with MPC Alt. A	Rev. Base with MPC Alt. B	Rev. Base with MPC Alt. C	Rev. Base w\ MPC Alt.C Tolled- $0.04	Rev. Base w\ MPC Alt.C Tolled- $0.10	Rev. Base with MPC Alt. D	Rev. Base with MPC Alt D2	Rev. Base with MPC Alt. E	Rev. Base with MPC Alt. F	Rev. Base with MPC Alt. G	Rev. Base w\ MPC Alt.C 8 lane QEW	Rev. Base with Bridge
System Travel (Veh-Km)	3,141,717	3,088,727	3,064,308	2,879,298	3,169,179	3,166,314	3,166,844	3,167,763	3,104,892	3,141,220	3,110,741	3,124,757	2,900,059	3,113,408	3,122,736	2,939,081
System Travel Time (Veh-Hrs)	64,440	60,753	59,126	56,781	61,705	61,640	60,434	60,490	62,447	59,684	59,196	59,431	56,959	62,438	58,622	58,592
Average System Speed (km/h)	48.8	50.8	51.8	50.7	51.4	51.4	52.4	52.4	49.7	52.6	52.6	52.6	50.9	49.9	53.3	50.2
Km of Roadway	4,793.7	4,778.2	4,774.0	4,779.2	4,962.8	4,950.5	4,987.5	4,987.5	4,987.5	4,947.7	4,919.6	4,932.6	4,775.6	4,830.0	4,987.5	4,774.0
Km Exceeding Volume/Capacity of 1.0	393	286	222	295	297	303	271	271	362	230	230	227	278	358	220	290
% Exceeding Capacity	8.2%	6.0%	4.7%	6.2%	6.0%	6.1%	5.4%	5.4%	7.3%	4.7%	4.7%	4.6%	5.8%	7.4%	4.4%	6.1%

APPENDIX K
QEW/HIGHWAY 403 DEFICIENCY ANALYSIS

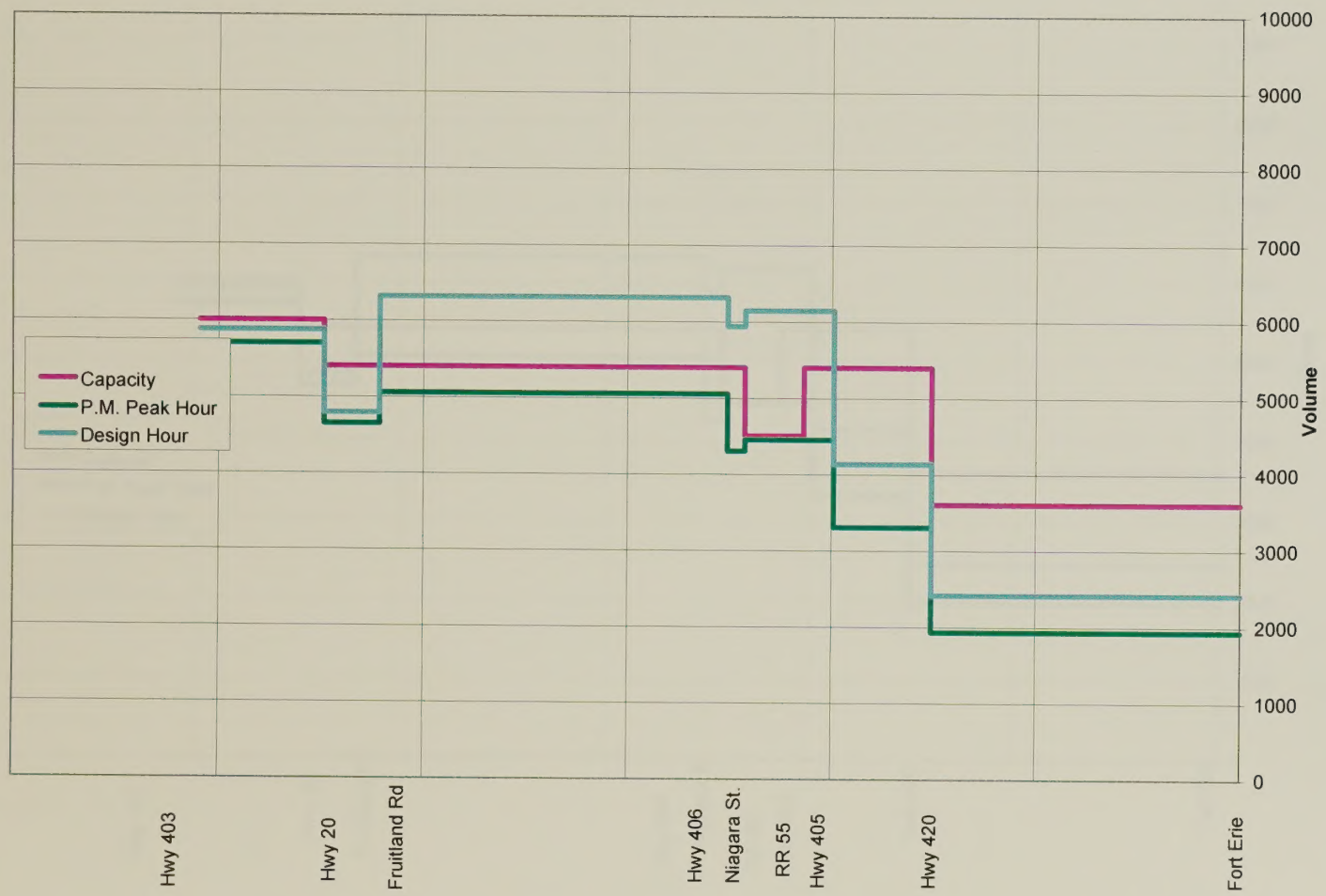
6 Lane QEW- Year 2021 Volumes

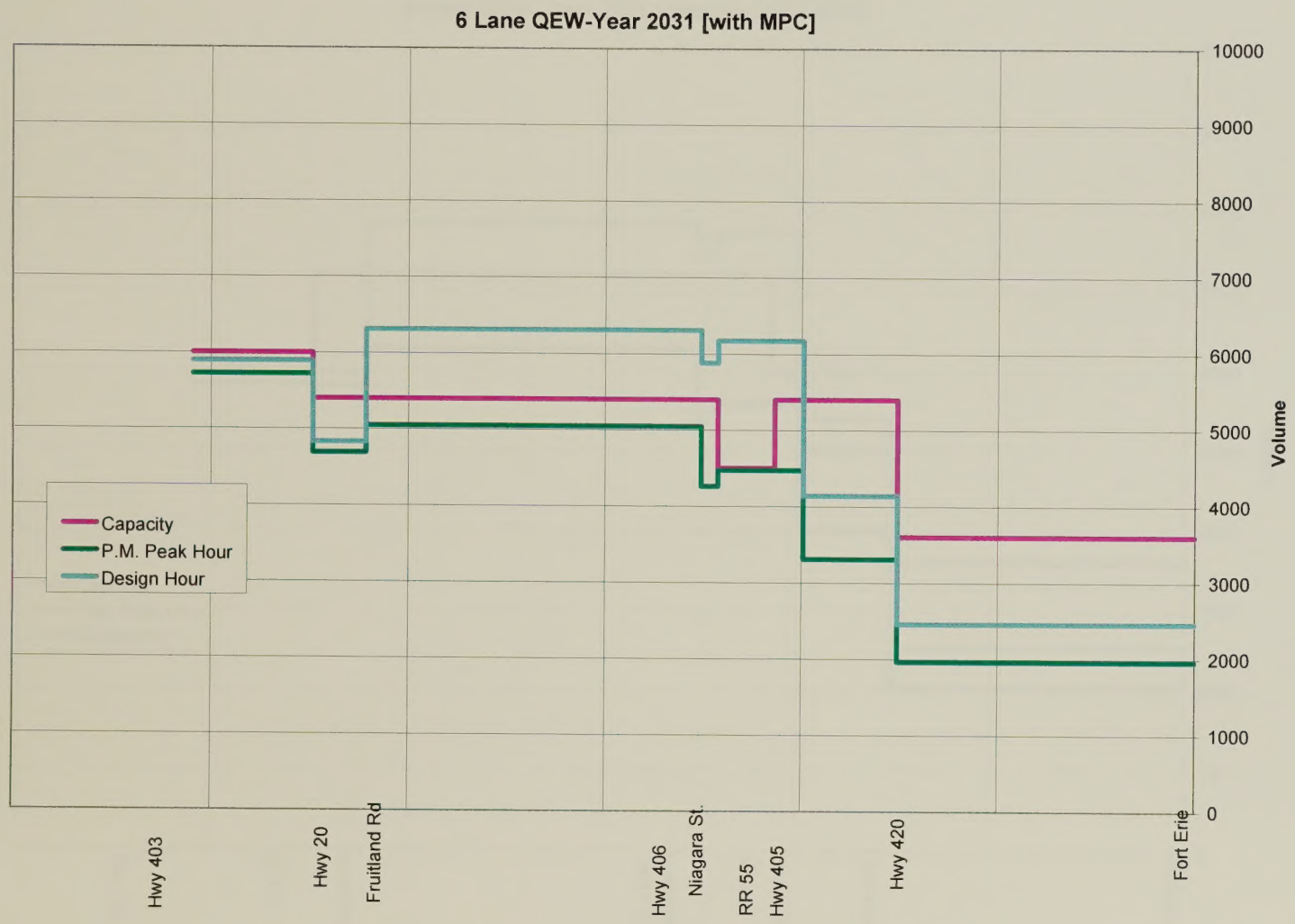


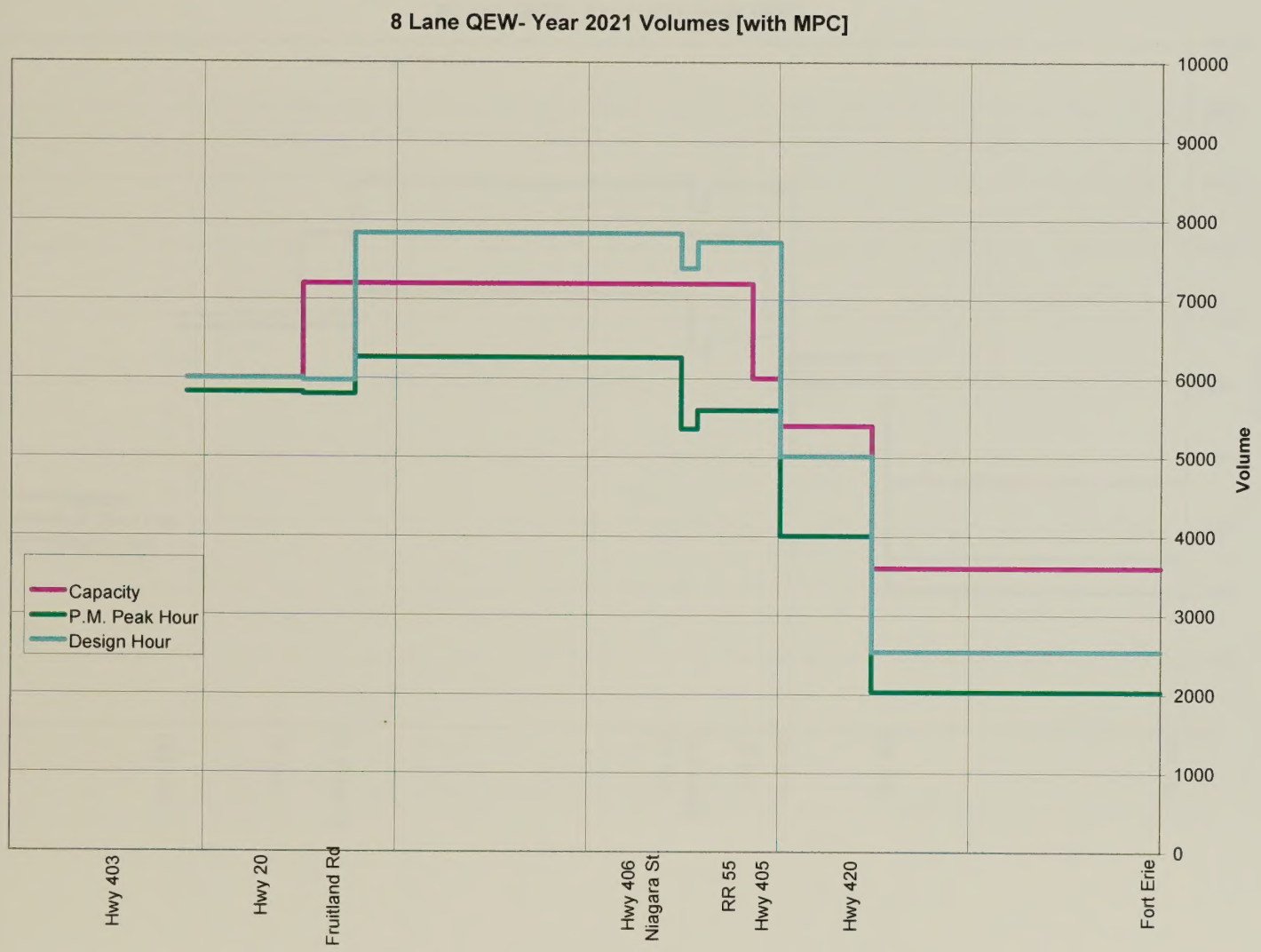
8 Lane QEW - Year 2031

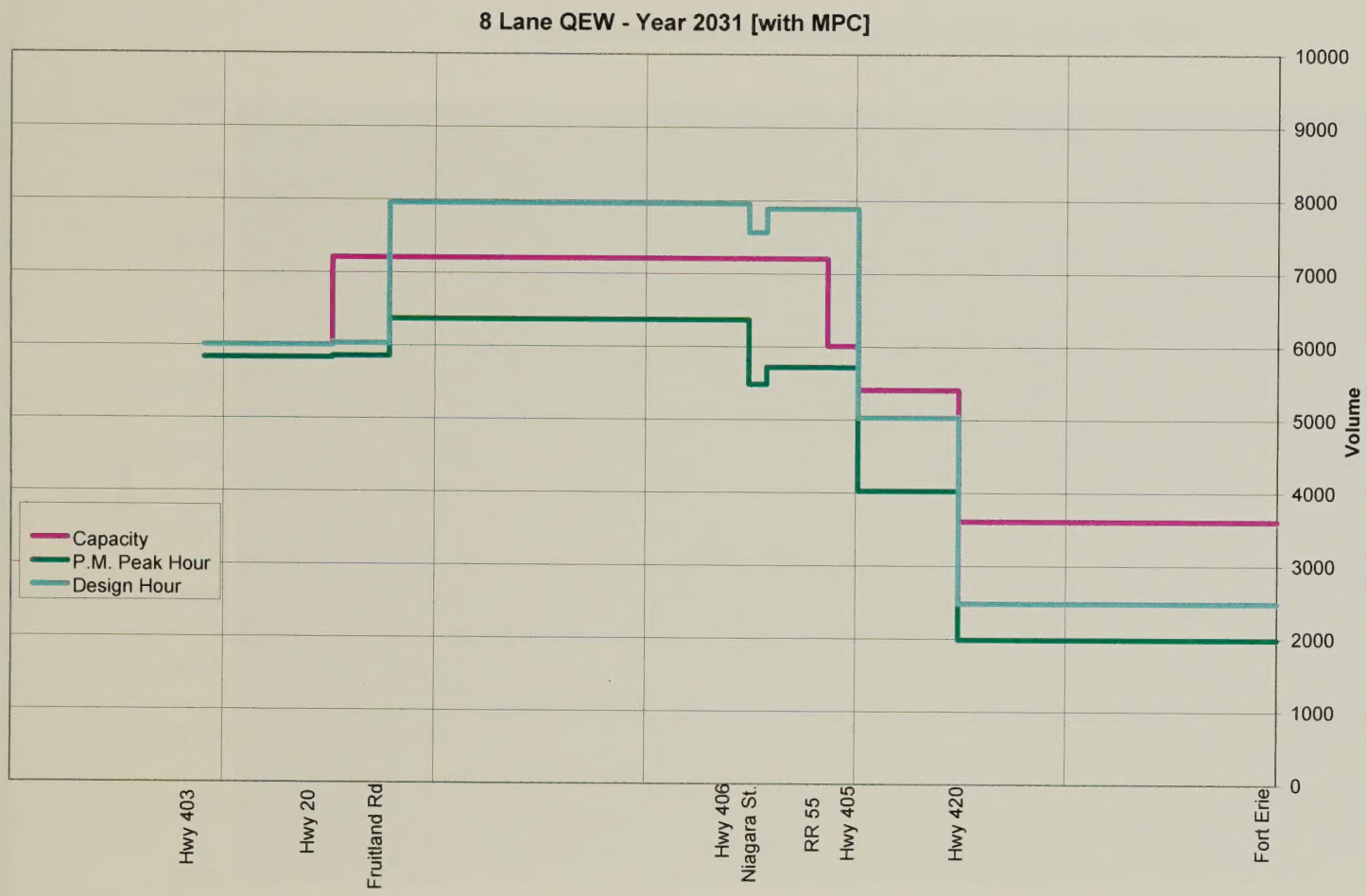


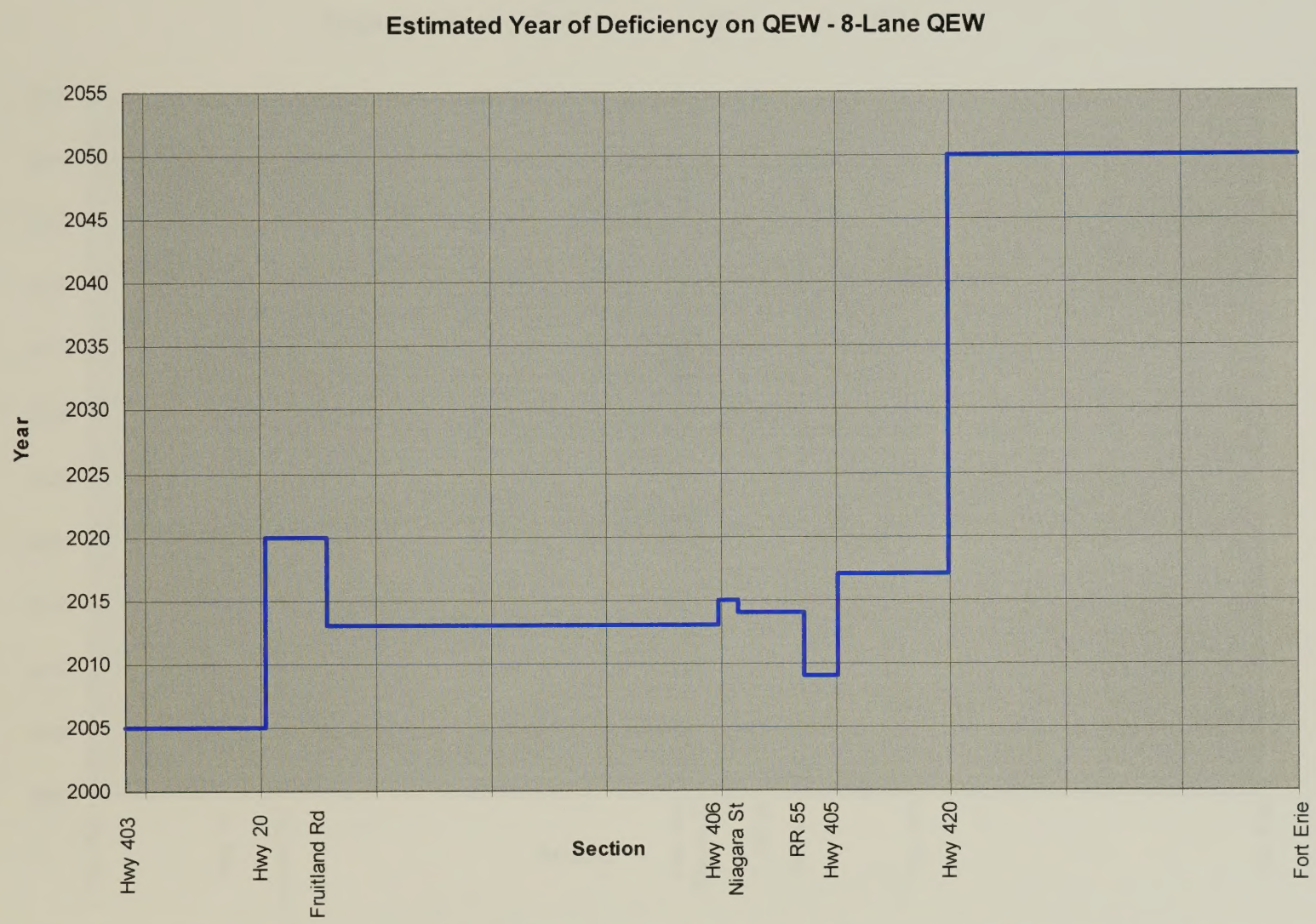
6-Lane QEW -Year 2021 [with MPC]



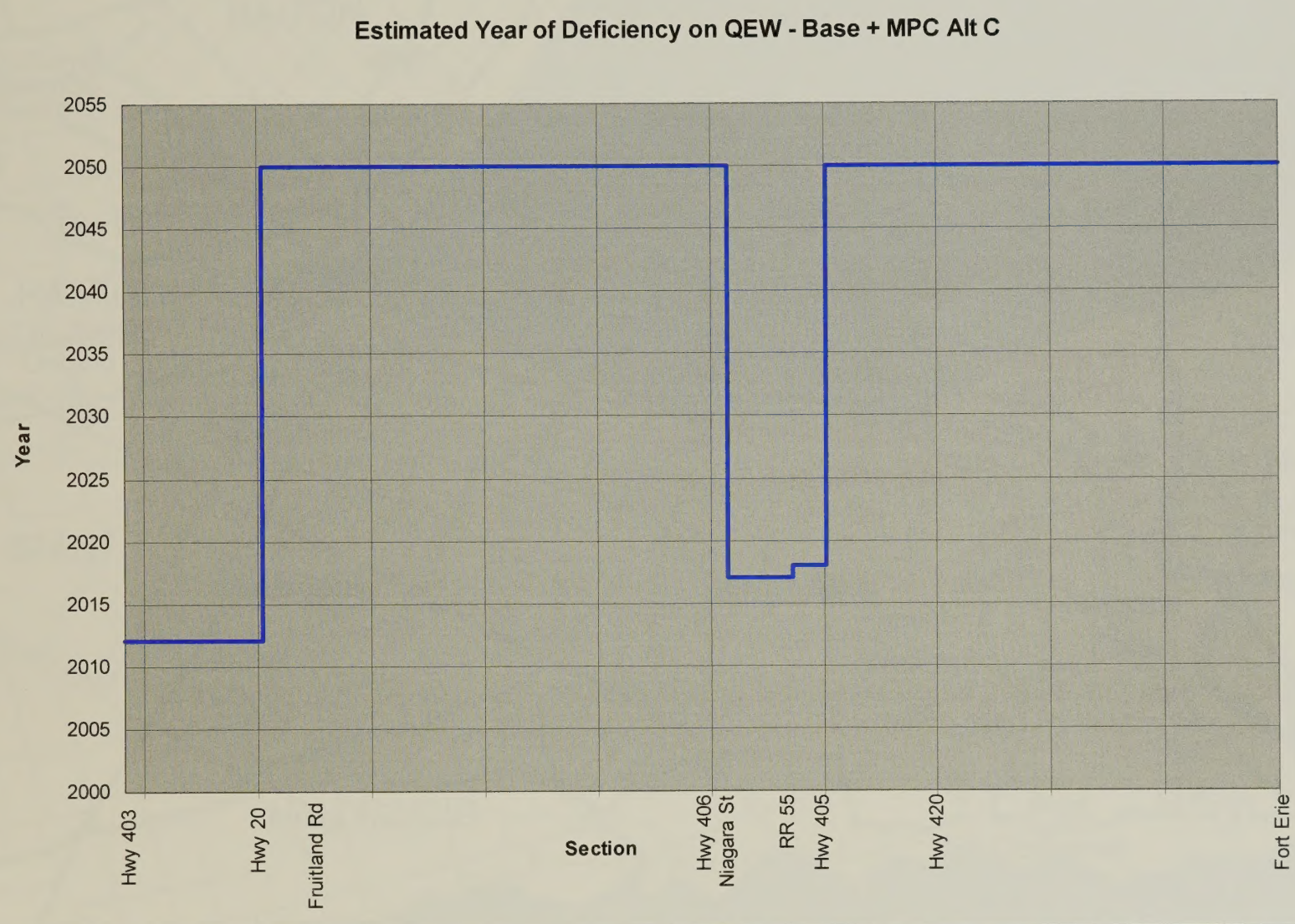

6 Lane QEW-Year 2031 [with MPC]
Volume
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Capacity
P.M. Peak Hour
Design Hour
Hwy 403
Hwy 20
Fruitland Rd
Hwy 406
Niagara St.
RR 55
Hwy 405
Hwy 420
Fort Erie


8 Lane QEW- Year 2021 Volumes [with MPC]
Volume
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Capacity
P.M. Peak Hour
Design Hour
Hwy 403
Hwy 20
Fruitland Rd
Hwy 406
Niagara St
RR 55
Hwy 405
Hwy 420
Fort Erie

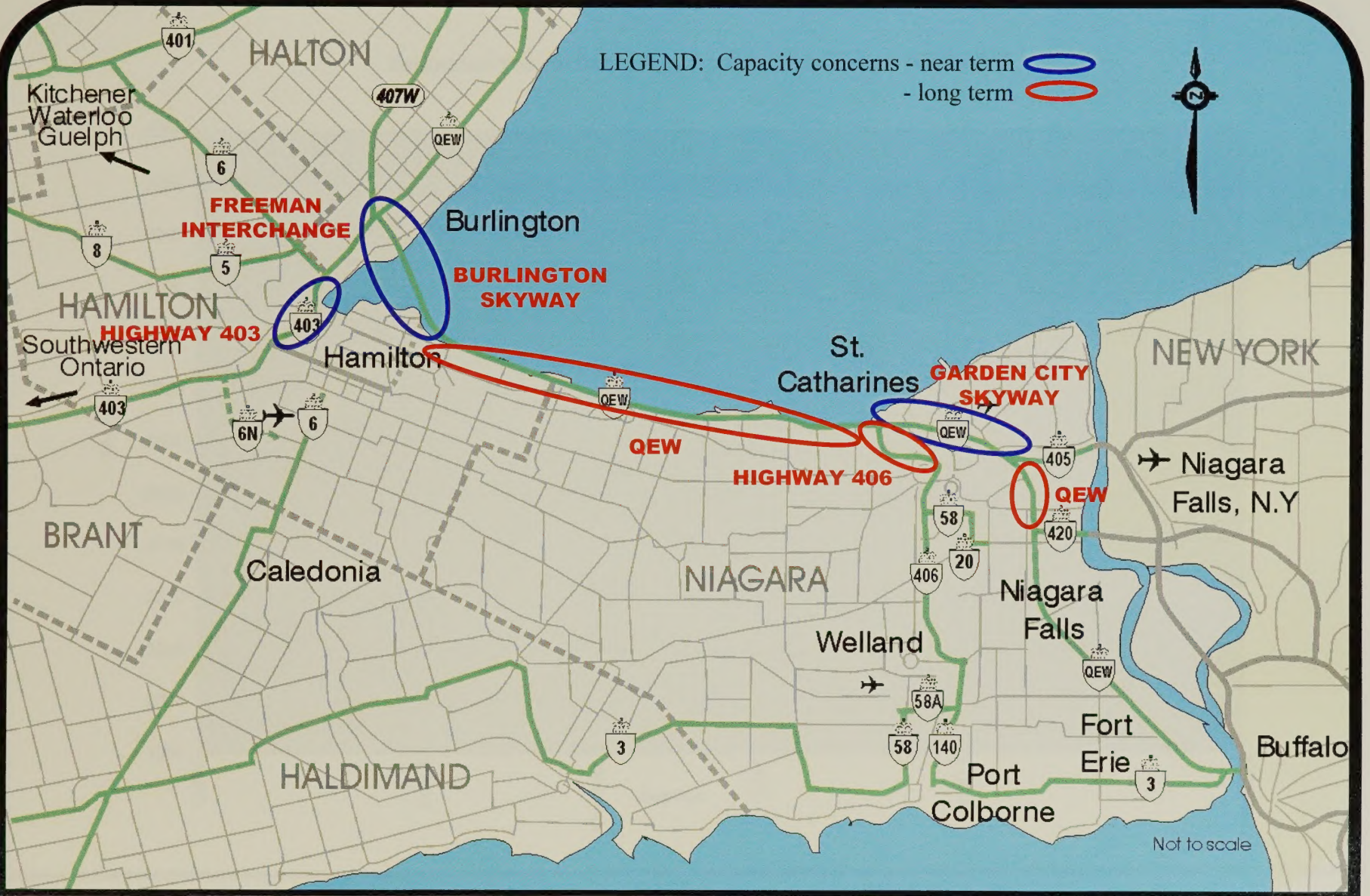

8 Lane QEW - Year 2031 [with MPC]
Volume
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Capacity
P.M. Peak Hour
Design Hour
Hwy 403
Hwy 20
Fruitland Rd
Hwy 406
Niagara St.
RR 55
Hwy 405
Hwy 420
Fort Erie



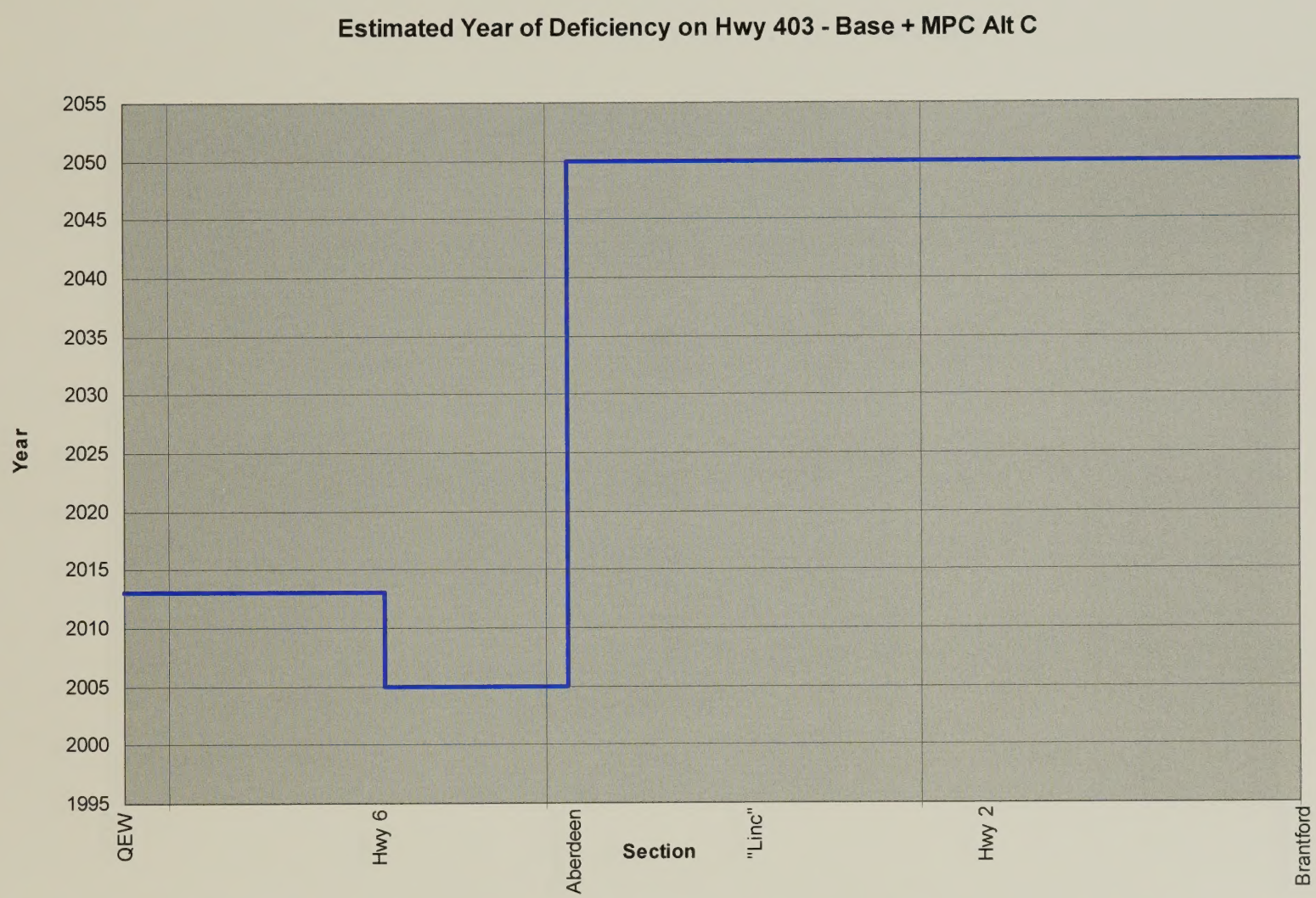
QEW Deficiency Analysis
8-Lane QEW - Design Hour



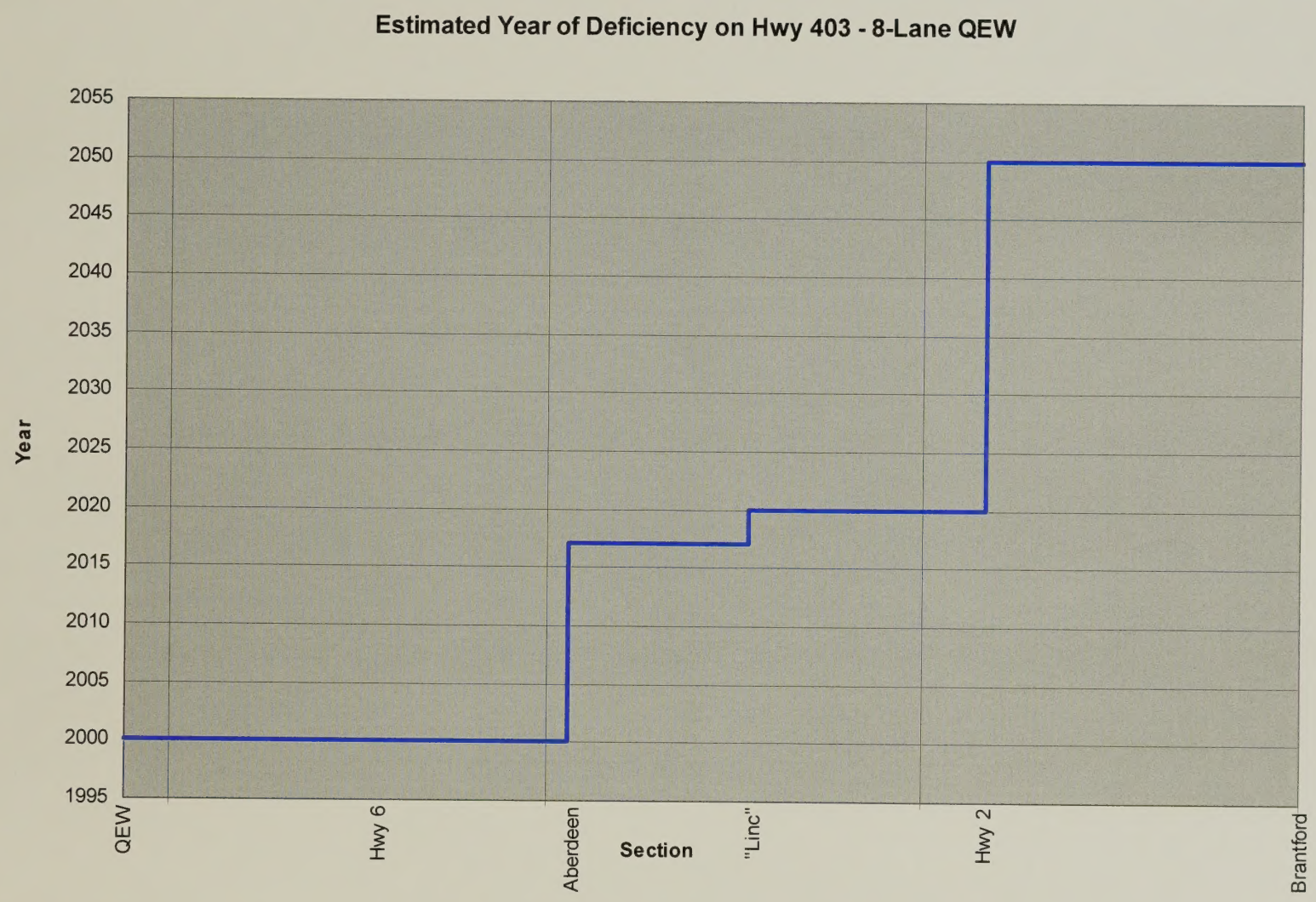
QEW Deficiency Analysis
Base Network plus MPC Alt C - Design Hour



Existing and Future Transportation Deficiencies



Hwy 403 Deficiency Analysis
Base Network plus MPC Alt C - Design Hour



Hwy 403 Deficiency Analysis
8-Lane QEW - Design Hour

APPENDIX L

Sensitivity Testing

APPENDIX L
SENSITIVITY TESTS – VOLUME PLOTS

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

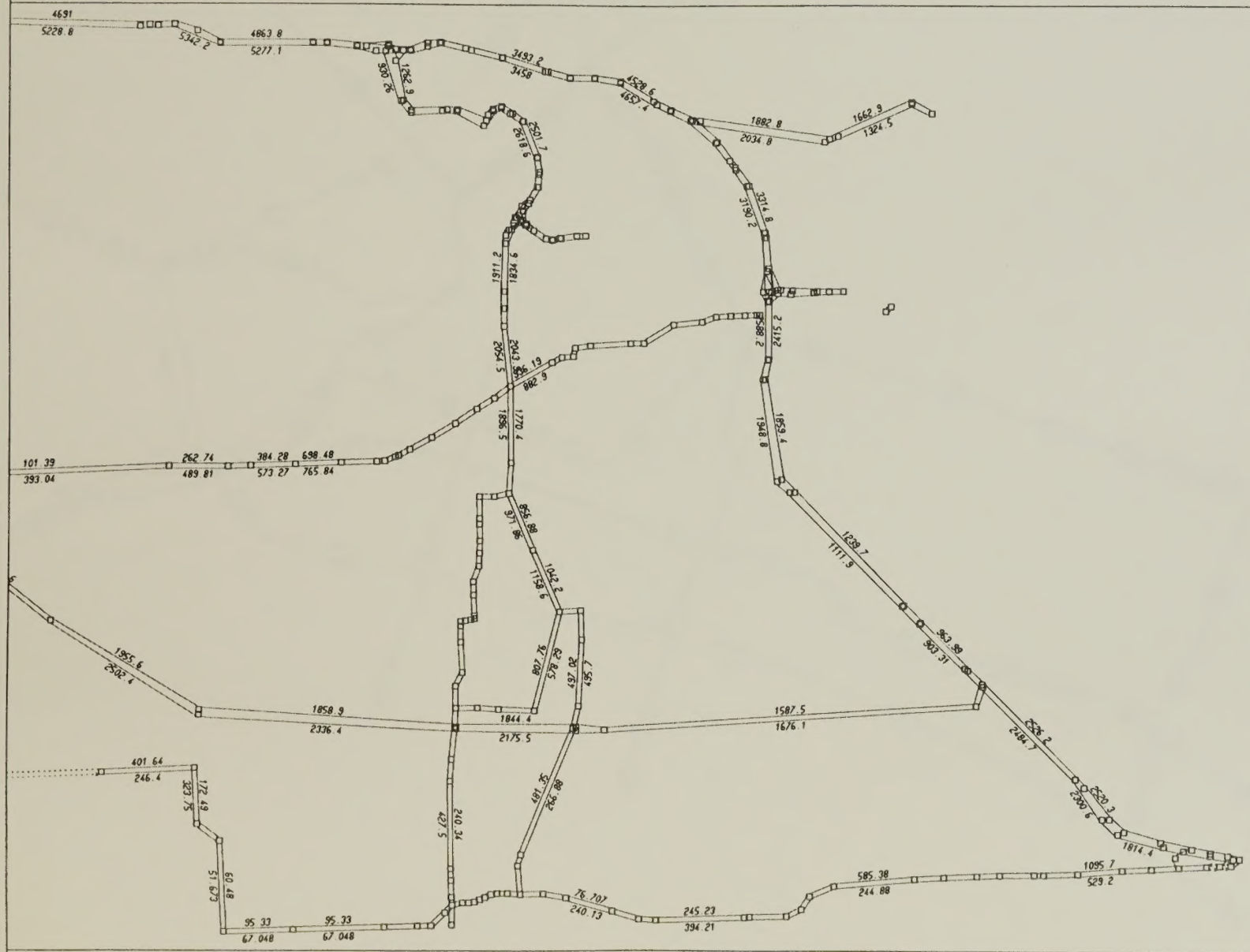
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3187: Year 2031 pmpkhr HIGH-Rev Base NEt w\MPC Alt.C2 Grimsby Link

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3187: Year 2031 pmpkhr HIGH-Rev Base NEt w\MPC Alt.C2 Grimsby Link

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3187: Year 2031 pmpkhr HIGH-Rev Base NEt w\MPC Alt.C2 Grimsby Link

01-05-09 10:45
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

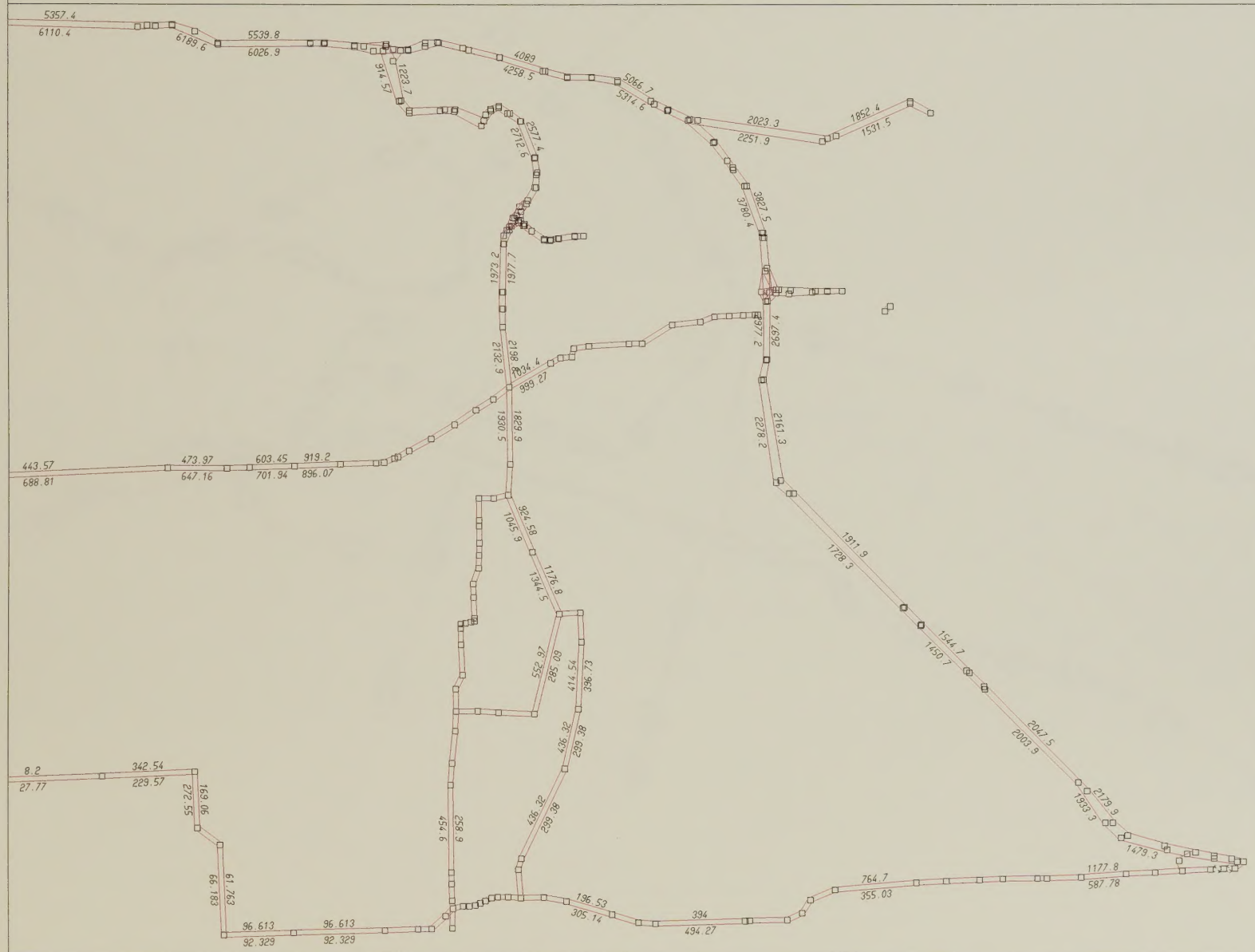
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3222: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.G

02-07-09 08:33
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3222: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.G

02-07-09 08:33
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3222: Year 2031 pmpkhr HIGH-Revised Base NEtwork w\MPC Alt.G

02-07-09 08:33
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Q:
572276/ 739519
671571/ 813990

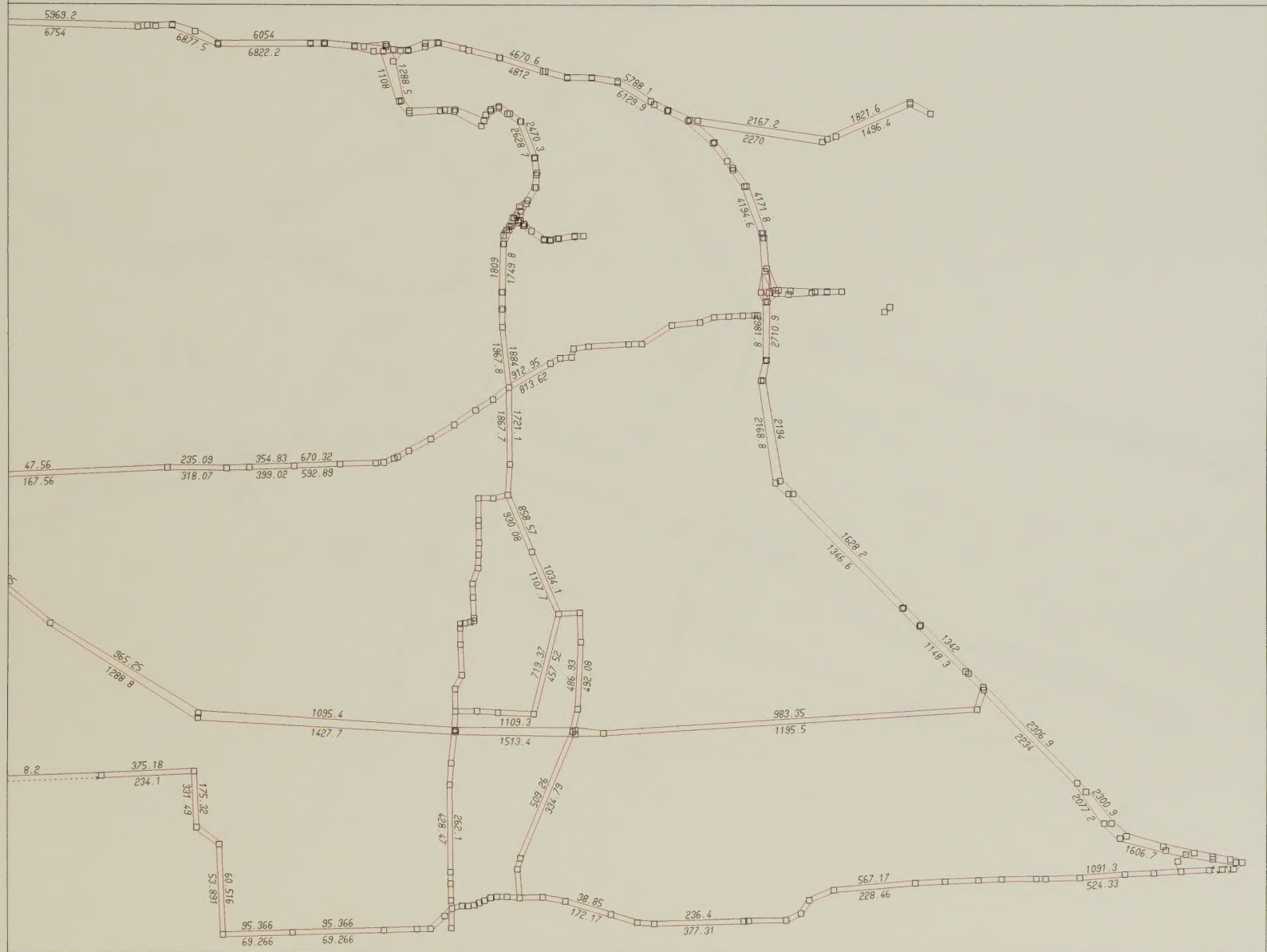
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3332: Year 2031 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

02-07-09 08:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3332: Year 2031 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

02-07-09 08:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3332: Year 2031 pmpkhr HIGH-Sens Test MPC Alt.C w\8lane QEW

02-07-09 08:38
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2152: Year 2021 pmpkhr HIGH-Revised Base NEtwork w\10 lane QEW

02-07-09 08:39
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2152: Year 2021 pmpkhr HIGH-Revised Base NEtwork w\10 lane QEW

02-07-09 08:39
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 2152: Year 2021 pmpkhr HIGH-Revised Base NEtwork w\10 lane QEW

02-07-09 08:39
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3152: Year 2031 pmpkhr HIGH-Revised Base Network w\10 lane QEW

02-07-09 08:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

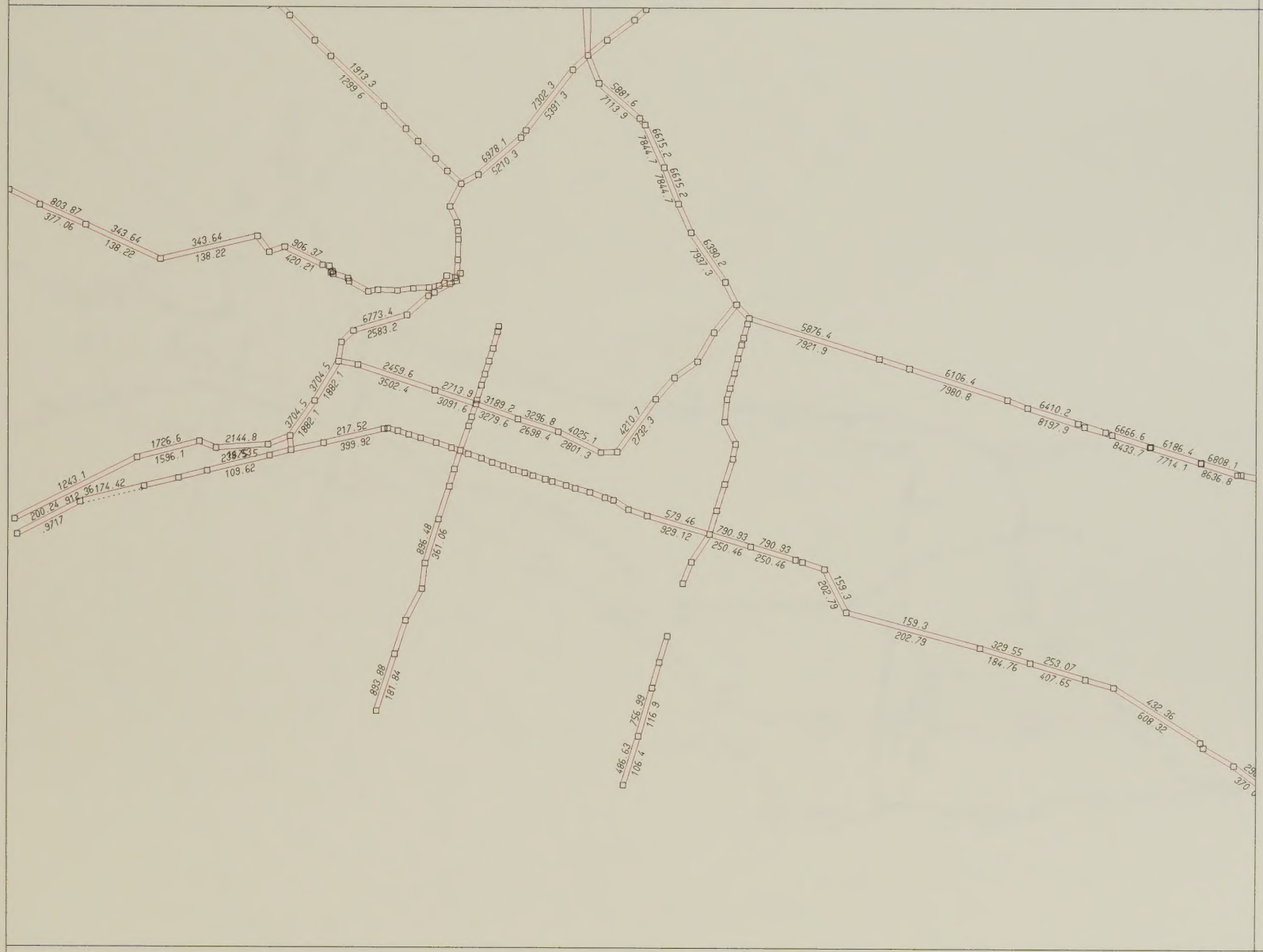
EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3152: Year 2031 pmpkhr HIGH-Revised Base Network w\10 lane QEW

02-07-09 08:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2



LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3152: Year 2031 pmpkhr HIGH-Revised Base Network w\10 lane QEW

02-07-09 08:40
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101,600

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3186: Year 2031 HIGH-Rev Base NEt w\MPC Alt.C Alt Landuse(Sc B)

02-07-09 08:41
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3186: Year 2031 HIGH-Rev Base NEt w\MPC Alt.C Alt Landuse(Sc B)

02-07-09 08:41
MODULE: 2.13
TSH.....dd

BASE NETWORK

USER DEFINED LINK DATA 1

emme/2

LINKS:
type=11
type=21
type=31
type=101.600

WINDOW Y:
572709/ 764853
620149/ 800434

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 3186: Year 2031 HIGH-Rev Base NEt w\MPC Alt.C Alt Landuse(Sc B)

02-07-09 08:41
MODULE: 2.13
TSH.....dd

MTO - Niagara N[illegible] Assessment
Corridor Assess[illegible]
Revised Base Network w\ MPC Alt. C2, Grimsby Link
High Tourist Condition
Year 2031 - Volumes

Facility	Section From	Section To	Base Assignment - Peak Direction Auto	Truck	Total	Adjustment - Local Trucks %	Trucks	Adj Total	Adjustment - Design Hour %	Adj Total	Capacity	Volume/Capacity P.M. Pk Hour	Design Hour	Level of Service P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,834	58	1,891	0.0%	-	1,891	25%	2,364	3,600	0.53	0.66	B	C
	Hwy 420	Hwy 405	3,180	68	3,247	0.0%	-	3,247	25%	4,059	5,400	0.60	0.75	B	C
	Hwy 405	RR 55	4,031	313	4,344	0.0%	-	4,344	38%	5,995	5,400	0.80	1.11	D	F
	RR 55	Ontario Street	4,031	313	4,344	0.0%	-	4,344	38%	5,995	4,500	0.97	1.33	E	F
	Ontario Street	Hwy 406	3,911	247	4,158	0.0%	-	4,158	38%	5,738	5,400	0.77	1.06	C	F
	Hwy 406	Fruitland	4,561	358	4,919	0.0%	-	4,919	25%	6,148	5,400	0.91	1.14	E	F
	Fruitland	Hwy 20	4,267	534	4,801	0.0%	-	4,801	3%	4,945	5,400	0.89	0.92	D	E
	Hwy 20	Hwy 403	5,221	560	5,780	0.0%	-	5,780	3%	5,954	6,000	0.96	0.99	E	E
Hwy 403	Brantford	Hwy 2	1,275	-	1,275	15.0%	191	1,467	3%	1,511	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,651	46	2,697	15.0%	398	3,094	3%	3,187	3,600	0.86	0.89	D	D
	RHC Express.	Aberdeen	3,421	46	3,467	15.0%	513	3,980	3%	4,100	3,600	1.11	1.14	F	F
	Aberdeen	Hwy 6	6,573	92	6,665	0.0%	-	6,665	3%	6,865	6,000	1.11	1.14	F	F
	Hwy 6	QEW	6,552	90	6,642	0.0%	-	6,642	3%	6,841	5,400	1.23	1.27	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,465	-	1,465	6.5%	95	1,560	3%	1,607	1,600	0.98	1.00	E	F
	Rymal Rd	RHC Express.	1,168	-	1,168	6.5%	76	1,244	3%	1,282	1,600	0.78	0.80	C	D
	RHC Express.	Claremont	1,593	-	1,593	6.5%	104	1,697	3%	1,748	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	346	-	346	12.0%	42	388	3%	399	2,400	0.16	0.17	A	A
	Fiddlers Green	Hwy 6	592	-	592	12.0%	71	664	3%	683	1,200	0.55	0.57	B	B
	Hwy 6	Hwy 56	876	-	876	12.0%	105	981	3%	1,010	2,400	0.41	0.42	A	A
Hwy 20	QEW	Queenston	2,014	153	2,167	0.0%	-	2,167	25%	2,708	1,600	1.35	1.69	F	F
	Queenston	Mud St	2,183	-	2,183	0.0%	-	2,183	25%	2,729	1,600	1.36	1.71	F	F
	Mud St	Hwy 53	1,599	22	1,621	0.0%	-	1,621	25%	2,026	2,400	0.68	0.84	C	D
	Hwy 53	RR 27	582	10	592	7.0%	41	633	25%	791	2,400	0.26	0.33	A	A
	RR 27	Fonthill	393	-	393	7.0%	28	421	25%	526	900	0.47	0.58	A	B
	Fonthill	Hwy 406	1,253	-	1,253	7.0%	88	1,340	25%	1,675	1,800	0.74	0.93	C	E
	Hwy 406	Hwy 58	936	-	936	7.0%	66	1,002	25%	1,252	900	1.11	1.39	F	F
	Hwy 58	Montrose Rd	1,526	-	1,526	7.0%	107	1,633	25%	2,041	1,600	1.02	1.28	F	F
Hwy 405	QEW	Q-L Bridge	1,520	258	1,777	0.0%	-	1,777	38%	2,453	3,600	0.49	0.68	A	C
Hwy 420	QEW	Stanley Ave	2,237	41	2,278	0.0%	-	2,278	25%	2,848	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	419	39	458	0.0%	-	458	3%	472	900	0.51	0.52	B	B
Hwy 140	Welland	Hwy 3	427	-	427	7.0%	30	457	3%	471	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	585	-	585	4.5%	26	612	3%	630	1,800	0.34	0.35	A	A
	Hwy140	Hwy 58	240	-	240	4.5%	11	251	3%	258	900	0.28	0.29	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	-	-	-	4.5%	-	-	3%	-	900	-	-	A	A
Hwy 406	East Main Street	Hwy 20	1,158	0	1,158	0.0%	-	1,158	3%	1,193	2,400	0.48	0.50	A	A
	Hwy 20	Hwy 58	2,054	0	2,054	0.0%	-	2,054	3%	2,116	2,400	0.86	0.88	D	D
	Hwy 58	Geneva St	2,619	0	2,619	0.0%	-	2,619	3%	2,697	2,400	1.09	1.12	F	F
	Geneva St	QEW	1,057	103	1,160	0.0%	-	1,160	3%	1,195	2,400	0.48	0.50	A	A
RHC Expressway	QEW	Barton	2,869	-	2,869	0.0%	-	2,869	3%	2,955	2,400	1.20	1.23	F	F
	Barton	Queensway	2,990	46	3,036	0.0%	-	3,036	3%	3,127	2,400	1.26	1.30	F	F
	Queensway	King	3,279	46	3,325	0.0%	-	3,325	3%	3,425	2,400	1.39	1.43	F	F
	King	Mud St	3,848	46	3,893	0.0%	-	3,893	3%	4,010	2,400	1.62	1.67	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara N[illegible] Assessment
Corridor Assess[illegible]t
Revised Base Network w\ MPC Alt. G
High Tourist Condition
Year 2031 - Volumes

Facility	Section From	Section To	Base Assignment - Peak Direction Auto	Truck	Total	Adjustment - Local Trucks %	Trucks	Adj Total	Adjustment - Design Hour %	Adj Total	Capacity	Volume/Capacity P.M. Pk Hour	Design Hour	Level of Service P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,711	284	1,995	0.0%	-	1,995	25%	2,493	3,600	0.55	0.69	B	C
	Hwy 420	Hwy 405	3,219	304	3,523	0.0%	-	3,523	25%	4,404	5,400	0.65	0.82	C	D
	Hwy 405	RR 55	4,221	547	4,768	0.0%	-	4,768	38%	6,580	5,400	0.88	1.22	D	F
	RR 55	Ontario Street	4,221	547	4,768	0.0%	-	4,768	38%	6,580	4,500	1.06	1.46	F	F
	Ontario Street	Hwy 406	4,165	506	4,671	0.0%	-	4,671	38%	6,445	5,400	0.86	1.19	D	F
	Hwy 406	Fruitland	4,791	618	5,409	0.0%	-	5,409	25%	6,761	5,400	1.00	1.25	F	F
	Fruitland	Hwy 20	4,489	674	5,162	0.0%	-	5,162	3%	5,317	5,400	0.96	0.98	E	E
	Hwy 20	Hwy 403	5,482	620	6,102	0.0%	-	6,102	3%	6,285	6,000	1.02	1.05	F	F
Hwy 403	Brantford	Hwy 2	1,267	-	1,267	15.0%	190	1,457	3%	1,501	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,598	190	2,788	15.0%	390	3,178	3%	3,273	3,600	0.88	0.91	D	E
	RHC Express.	Aberdeen	3,227	125	3,352	15.0%	484	3,836	3%	3,951	3,600	1.07	1.10	F	F
	Aberdeen	Hwy 6	6,537	97	6,634	0.0%	-	6,634	3%	6,833	6,000	1.11	1.14	F	F
	Hwy 6	QEW	6,487	85	6,572	0.0%	-	6,572	3%	6,769	5,400	1.22	1.25	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,411	-	1,411	6.5%	92	1,503	3%	1,548	1,600	0.94	0.97	E	E
	Rymal Rd	RHC Express.	1,171	-	1,171	6.5%	76	1,247	3%	1,284	1,600	0.78	0.80	C	D
	RHC Express.	Claremont	1,563	-	1,563	6.5%	102	1,664	3%	1,714	2,000	0.83	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	324	-	324	12.0%	39	363	3%	373	2,400	0.15	0.16	A	A
	Fiddlers Green	Hwy 6	694	-	694	12.0%	83	778	3%	801	1,200	0.65	0.67	B	C
	Hwy 6	Hwy 56	1,136	5	1,141	12.0%	136	1,277	3%	1,316	2,400	0.53	0.55	B	B
Hwy 20	QEW	Queenston	2,133	155	2,288	0.0%	-	2,288	25%	2,860	1,600	1.43	1.79	F	F
	Queenston	Mud St	2,302	-	2,302	0.0%	-	2,302	25%	2,878	1,600	1.44	1.80	F	F
	Mud St	Hwy 53	1,334	14	1,348	0.0%	-	1,348	25%	1,686	2,400	0.56	0.70	B	C
	Hwy 53	RR 27	873	15	888	7.0%	61	949	25%	1,186	2,400	0.40	0.49	A	A
	RR 27	Fonthill	638	25	663	7.0%	45	708	25%	885	900	0.79	0.98	C	E
	Fonthill	Hwy 406	1,469	1	1,470	7.0%	103	1,573	25%	1,966	1,800	0.87	1.09	D	F
	Hwy 406	Hwy 58	1,028	3	1,031	7.0%	72	1,103	25%	1,379	900	1.23	1.53	F	F
	Hwy 58	Montrose Rd	1,555	-	1,555	7.0%	109	1,663	25%	2,079	1,600	1.04	1.30	F	F
Hwy 405	QEW	Q-L Bridge	1,730	261	1,991	0.0%	-	1,991	38%	2,747	3,600	0.55	0.76	B	C
Hwy 420	QEW	Stanley Ave	2,225	39	2,264	0.0%	-	2,264	25%	2,830	3,600	0.63	0.79	B	C
Hwy 58	Hwy 406	Hwy 3	415	-	415	0.0%	-	415	3%	427	900	0.46	0.47	A	A
Hwy 140	Welland	Hwy 3	455	-	455	7.0%	32	486	3%	501	800	0.61	0.63	B	B
Hwy 3	Fort Erie	Hwy 140	765	-	765	4.5%	34	799	3%	823	1,800	0.44	0.46	A	A
	Hwy140	Hwy 58	274	15	290	4.5%	12	302	3%	311	900	0.34	0.35	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	-	14	14	4.5%	-	14	3%	14	900	0.02	0.02	A	A
Hwy 406	East Main Street	Hwy 20	1,344	0	1,344	0.0%	-	1,344	3%	1,385	2,400	0.56	0.58	B	B
	Hwy 20	Hwy 58	2,188	5	2,194	0.0%	-	2,194	3%	2,259	2,400	0.91	0.94	E	E
	Hwy 58	Geneva St	2,662	25	2,687	0.0%	-	2,687	3%	2,768	2,400	1.12	1.15	F	F
	Geneva St	QEW	1,009	107	1,116	0.0%	-	1,116	3%	1,150	2,400	0.47	0.48	A	A
RHC Expressway	QEW	Barton	2,820	114	2,934	0.0%	-	2,934	3%	3,022	2,400	1.22	1.26	F	F
	Barton	Queensway	2,810	125	2,935	0.0%	-	2,935	3%	3,023	2,400	1.22	1.26	F	F
	Queensway	King	3,223	125	3,348	0.0%	-	3,348	3%	3,448	2,400	1.39	1.44	F	F
	King	Mud St	3,693	125	3,818	0.0%	-	3,818	3%	3,933	2,400	1.59	1.64	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara [illegible]s Assessment
Corridor Asses[illegible]nt
Revised Base Network w\ MPC Alt. C and 8 lane QEW
High Tourist Condition
Year 2021 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,842	189	2,031	0.0%	-	2,031	25%	2,539	3,600	0.56	0.71	B	C
	Hwy 420	Hwy 405	3,829	181	4,010	0.0%	-	4,010	25%	5,013	7,200	0.56	0.70	B	C
	Hwy 405	RR 55	5,229	368	5,597	0.0%	-	5,597	38%	7,724	7,200	0.78	1.07	C	F
	RR 55	Ontario Street	5,229	368	5,597	0.0%	-	5,597	38%	7,724	6,000	0.93	1.29	E	F
	Ontario Street	Hwy 406	5,043	315	5,358	0.0%	-	5,358	38%	7,394	7,200	0.74	1.03	C	F
	Hwy 406	Fruitland	5,861	406	6,266	0.0%	-	6,266	25%	7,833	7,200	0.87	1.09	D	F
	Fruitland	Hwy 20	5,360	439	5,798	0.0%	-	5,798	3%	5,972	7,200	0.81	0.83	D	D
	Hwy 20	Hwy 403	5,382	440	5,822	0.0%	-	5,822	3%	5,997	6,000	0.97	1.00	E	E
Hwy 403	Brantford	Hwy 2	1,243	-	1,243	15.0%	186	1,429	3%	1,472	2,400	0.60	0.61	B	B
	Hwy 2	RHC Express.	2,582	81	2,663	15.0%	387	3,051	3%	3,142	3,600	0.85	0.87	D	D
	RHC Express.	Aberdeen	3,325	83	3,408	15.0%	499	3,907	3%	4,024	3,600	1.09	1.12	F	F
	Aberdeen	Hwy 6	6,437	79	6,516	0.0%	-	6,516	3%	6,711	6,000	1.09	1.12	F	F
	Hwy 6	QEW	6,383	87	6,471	0.0%	-	6,471	3%	6,665	5,400	1.20	1.23	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,409	2	1,411	6.5%	92	1,502	3%	1,548	1,600	0.94	0.97	E	E
	Rymal Rd	RHC Express.	1,114	2	1,117	6.5%	72	1,189	3%	1,225	1,600	0.74	0.77	C	C
	RHC Express.	Claremont	1,522	2	1,524	6.5%	99	1,623	3%	1,672	2,000	0.81	0.84	D	D
Hwy 53	Hwy 2	Fiddlers Green	352	-	352	12.0%	42	394	3%	406	2,400	0.16	0.17	A	A
	Fiddlers Green	Hwy 6	561	-	561	12.0%	67	628	3%	647	1,200	0.52	0.54	B	B
	Hwy 6	Hwy 56	840	-	840	12.0%	101	941	3%	969	2,400	0.39	0.40	A	A
Hwy 20	QEW	Queenston	1,989	132	2,122	0.0%	-	2,122	25%	2,652	1,600	1.33	1.66	F	F
	Queenston	Mud St	2,078	11	2,089	0.0%	-	2,089	25%	2,611	1,600	1.31	1.63	F	F
	Mud St	Hwy 53	1,580	36	1,615	0.0%	-	1,615	25%	2,019	2,400	0.67	0.84	C	D
	Hwy 53	RR 27	534	-	534	7.0%	37	572	25%	715	2,400	0.24	0.30	A	A
	RR 27	Fonthill	117	-	117	7.0%	8	125	25%	156	900	0.14	0.17	A	A
	Fonthill	Hwy 406	1,090	-	1,090	7.0%	76	1,166	25%	1,458	1,800	0.65	0.81	B	D
	Hwy 406	Hwy 58	891	-	891	7.0%	62	953	25%	1,191	900	1.06	1.32	F	F
	Hwy 58	Montrose Rd	1,482	-	1,482	7.0%	104	1,586	25%	1,982	1,600	0.99	1.24	E	F
Hwy 405	QEW	Q-L Bridge	1,687	187	1,874	0.0%	-	1,874	38%	2,586	3,600	0.52	0.72	B	C
Hwy 420	QEW	Stanley Ave	2,229	30	2,259	0.0%	-	2,259	25%	2,823	3,600	0.63	0.78	B	C
Hwy 58	Hwy 406	Hwy 3	450	29	479	0.0%	-	479	3%	493	900	0.53	0.55	B	B
Hwy 140	Welland	Hwy 3	417	-	417	7.0%	29	446	3%	460	800	0.56	0.57	B	B
Hwy 3	Fort Erie	Hwy 140	518	-	518	4.5%	23	541	3%	557	1,800	0.30	0.31	A	A
	Hwy140	Hwy 58	163	-	163	4.5%	7	171	3%	176	900	0.19	0.20	A	A
	Hwy 58	Wainfleet	93	-	93	4.5%	4	97	3%	100	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,115	0	1,115	0.0%	-	1,115	3%	1,148	2,400	0.46	0.48	A	A
	Hwy 20	Hwy 58	1,929	0	1,929	0.0%	-	1,929	3%	1,987	2,400	0.80	0.83	D	D
	Hwy 58	Geneva St	2,597	-	2,597	0.0%	-	2,597	3%	2,675	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,115	90	1,205	0.0%	-	1,205	3%	1,241	2,400	0.50	0.52	B	B
RHC Expressway	QEW	Barton	3,047	51	3,098	0.0%	-	3,098	3%	3,191	2,400	1.29	1.33	F	F
	Barton	Queensway	2,927	81	3,008	0.0%	-	3,008	3%	3,099	2,400	1.25	1.29	F	F
	Queensway	King	3,284	81	3,365	0.0%	-	3,365	3%	3,466	2,400	1.40	1.44	F	F
	King	Mud St	3,823	81	3,905	0.0%	-	3,905	3%	4,022	2,400	1.63	1.68	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara N[illegible] Assessment
Corridor Assess[illegible]
Revised Base Network w\ 10 lane QEW
High Tourist Condition
Year 2021 - Volumes

Facility	Section From	Section To	Base Assignment - Peak Direction Auto	Truck	Total	Adjustment - Local Trucks %	Trucks	Adj Total	Adjustment - Design Hour %	Adj Total	Capacity	Volume/Capacity P.M. Pk Hour	Design Hour	Level of Service P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,946	286	2,232	0.0%	-	2,232	25%	2,790	3,600	0.62	0.78	B	C
	Hwy 420	Hwy 405	4,293	302	4,595	0.0%	-	4,595	25%	5,743	9,000	0.51	0.64	B	B
	Hwy 405	RR 55	6,149	484	6,633	0.0%	-	6,633	38%	9,154	9,000	0.74	1.02	C	F
	RR 55	Ontario Street	6,149	484	6,633	0.0%	-	6,633	38%	9,154	7,000	0.95	1.31	E	F
	Ontario Street	Hwy 406	5,940	430	6,370	0.0%	-	6,370	38%	8,791	9,000	0.71	0.98	C	E
	Hwy 406	Fruitland	6,746	539	7,285	0.0%	-	7,285	25%	9,106	9,000	0.81	1.01	D	F
	Fruitland	Hwy 20	6,392	597	6,990	0.0%	-	6,990	3%	7,199	9,000	0.78	0.80	C	C
	Hwy 20	Hwy 403	6,554	587	7,141	0.0%	-	7,141	3%	7,356	7,500	0.95	0.98	E	E
Hwy 403	Brantford	Hwy 2	1,249	-	1,249	15.0%	187	1,437	3%	1,480	2,400	0.60	0.62	B	B
	Hwy 2	RHC Express.	2,567	109	2,675	15.0%	385	3,060	3%	3,152	3,600	0.85	0.88	D	D
	RHC Express.	Aberdeen	3,434	94	3,528	15.0%	515	4,043	3%	4,164	3,600	1.12	1.16	F	F
	Aberdeen	Hwy 6	6,719	78	6,797	0.0%	-	6,797	3%	7,001	6,000	1.13	1.17	F	F
	Hwy 6	QEW	7,041	64	7,104	0.0%	-	7,104	3%	7,318	5,400	1.32	1.36	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,485	-	1,485	6.5%	97	1,582	3%	1,629	1,600	0.99	1.02	E	F
	Rymal Rd	RHC Express.	1,220	-	1,220	6.5%	79	1,299	3%	1,338	1,600	0.81	0.84	D	D
	RHC Express.	Claremont	1,590	-	1,590	6.5%	103	1,693	3%	1,744	2,000	0.85	0.87	D	D
Hwy 53	Hwy 2	Fiddlers Green	235	-	235	12.0%	28	264	3%	272	2,400	0.11	0.11	A	A
	Fiddlers Green	Hwy 6	648	-	648	12.0%	78	726	3%	747	1,200	0.60	0.62	B	B
	Hwy 6	Hwy 56	932	-	932	12.0%	112	1,043	3%	1,075	2,400	0.43	0.45	A	A
Hwy 20	QEW	Queenston	2,190	146	2,336	0.0%	-	2,336	25%	2,920	1,600	1.46	1.83	F	F
	Queenston	Mud St	2,205	-	2,205	0.0%	-	2,205	25%	2,756	1,600	1.38	1.72	F	F
	Mud St	Hwy 53	1,140	-	1,140	0.0%	-	1,140	25%	1,425	2,400	0.47	0.59	A	B
	Hwy 53	RR 27	736	-	736	7.0%	52	787	25%	984	2,400	0.33	0.41	A	A
	RR 27	Fonthill	43	-	43	7.0%	3	46	25%	57	900	0.05	0.06	A	A
	Fonthill	Hwy 406	1,156	-	1,156	7.0%	81	1,237	25%	1,546	1,800	0.69	0.86	C	D
	Hwy 406	Hwy 58	904	-	904	7.0%	63	967	25%	1,209	900	1.07	1.34	F	F
	Hwy 58	Montrose Rd	1,486	-	1,486	7.0%	104	1,590	25%	1,988	1,600	0.99	1.24	E	F
Hwy 405	QEW	Q-L Bridge	1,900	183	2,082	0.0%	-	2,082	38%	2,874	3,600	0.58	0.80	B	C
Hwy 420	QEW	Stanley Ave	2,211	31	2,242	0.0%	-	2,242	25%	2,803	3,600	0.62	0.78	B	C
Hwy 58	Hwy 406	Hwy 3	449	13	462	0.0%	-	462	3%	476	900	0.51	0.53	B	B
Hwy 140	Welland	Hwy 3	421	-	421	7.0%	29	451	3%	464	800	0.56	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	696	-	696	4.5%	31	727	3%	749	1,800	0.40	0.42	A	A
	Hwy140	Hwy 58	154	-	154	4.5%	7	161	3%	166	900	0.18	0.18	A	A
	Hwy 58	Wainfleet	94	-	94	4.5%	4	98	3%	101	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	8	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,139	17	1,156	0.0%	-	1,156	3%	1,191	2,400	0.48	0.50	A	A
	Hwy 20	Hwy 58	1,948	17	1,966	0.0%	-	1,966	3%	2,025	2,400	0.82	0.84	D	D
	Hwy 58	Geneva St	2,561	17	2,578	0.0%	-	2,578	3%	2,655	2,400	1.07	1.11	F	F
	Geneva St	QEW	1,136	136	1,272	0.0%	-	1,272	3%	1,310	2,400	0.53	0.55	B	B
RHC Expressway	QEW	Barton	3,465	33	3,498	0.0%	-	3,498	3%	3,603	2,400	1.46	1.50	F	F
	Barton	Queensway	3,133	94	3,226	0.0%	-	3,226	3%	3,323	2,400	1.34	1.38	F	F
	Queensway	King	3,389	94	3,482	0.0%	-	3,482	3%	3,587	2,400	1.45	1.49	F	F
	King	Mud St	3,946	94	4,040	0.0%	-	4,040	3%	4,161	2,400	1.68	1.73	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara [illegible]s Assessment
Corridor Asses[illegible]nt
Revised Base Network w\ MPC Alt. C and 8 lane QEW
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,803	183	1,986	0.0%	-	1,986	25%	2,482	3,600	0.55	0.69	B	C
	Hwy 420	Hwy 405	3,852	171	4,023	0.0%	-	4,023	25%	5,029	7,200	0.56	0.70	B	C
	Hwy 405	RR 55	5,302	414	5,716	0.0%	-	5,716	38%	7,888	7,200	0.79	1.10	C	F
	RR 55	Ontario Street	5,302	414	5,716	0.0%	-	5,716	38%	7,888	6,000	0.95	1.31	E	F
	Ontario Street	Hwy 406	5,131	348	5,479	0.0%	-	5,479	38%	7,561	7,200	0.76	1.05	C	F
	Hwy 406	Fruitland	5,903	459	6,363	0.0%	-	6,363	25%	7,953	7,200	0.88	1.10	D	F
	Fruitland	Hwy 20	5,344	507	5,851	0.0%	-	5,851	3%	6,026	7,200	0.81	0.84	D	D
	Hwy 20	Hwy 403	5,304	524	5,829	0.0%	-	5,829	3%	6,003	6,000	0.97	1.00	E	F
Hwy 403	Brantford	Hwy 2	1,270	-	1,270	15.0%	191	1,461	3%	1,505	2,400	0.61	0.63	B	B
	Hwy 2	RHC Express.	2,632	89	2,721	15.0%	395	3,116	3%	3,209	3,600	0.87	0.89	D	D
	RHC Express.	Aberdeen	3,358	89	3,448	15.0%	504	3,951	3%	4,070	3,600	1.10	1.13	F	F
	Aberdeen	Hwy 6	6,548	115	6,662	0.0%	-	6,662	3%	6,862	6,000	1.11	1.14	F	F
	Hwy 6	QEW	6,579	95	6,674	0.0%	-	6,674	3%	6,875	5,400	1.24	1.27	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,424	3	1,427	6.5%	93	1,520	3%	1,565	1,600	0.95	0.98	E	E
	Rymal Rd	RHC Express.	1,151	3	1,154	6.5%	75	1,228	3%	1,265	1,600	0.77	0.79	C	C
	RHC Express.	Claremont	1,565	3	1,568	6.5%	102	1,670	3%	1,720	2,000	0.84	0.86	D	D
Hwy 53	Hwy 2	Fiddlers Green	342	-	342	12.0%	41	383	3%	394	2,400	0.16	0.16	A	A
	Fiddlers Green	Hwy 6	588	-	588	12.0%	71	659	3%	678	1,200	0.55	0.57	B	B
	Hwy 6	Hwy 56	858	-	858	12.0%	103	961	3%	990	2,400	0.40	0.41	A	A
Hwy 20	QEW	Queenston	1,986	153	2,139	0.0%	-	2,139	25%	2,674	1,600	1.34	1.67	F	F
	Queenston	Mud St	2,126	12	2,138	0.0%	-	2,138	25%	2,672	1,600	1.34	1.67	F	F
	Mud St	Hwy 53	1,663	31	1,694	0.0%	-	1,694	25%	2,117	2,400	0.71	0.88	C	D
	Hwy 53	RR 27	597	-	597	7.0%	42	638	25%	798	2,400	0.27	0.33	A	A
	RR 27	Fonthill	168	-	168	7.0%	12	179	25%	224	900	0.20	0.25	A	A
	Fonthill	Hwy 406	1,110	-	1,110	7.0%	78	1,187	25%	1,484	1,800	0.66	0.82	C	D
	Hwy 406	Hwy 58	913	-	913	7.0%	64	977	25%	1,221	900	1.09	1.36	F	F
	Hwy 58	Montrose Rd	1,504	-	1,504	7.0%	105	1,609	25%	2,011	1,600	1.01	1.26	F	F
Hwy 405	QEW	Q-L Bridge	1,784	243	2,027	0.0%	-	2,027	38%	2,797	3,600	0.56	0.78	B	C
Hwy 420	QEW	Stanley Ave	2,269	55	2,324	0.0%	-	2,324	25%	2,905	3,600	0.65	0.81	B	D
Hwy 58	Hwy 406	Hwy 3	415	36	451	0.0%	-	451	3%	465	900	0.50	0.52	B	B
Hwy 140	Welland	Hwy 3	428	-	428	7.0%	30	458	3%	472	800	0.57	0.59	B	B
Hwy 3	Fort Erie	Hwy 140	567	-	567	4.5%	26	593	3%	610	1,800	0.33	0.34	A	A
	Hwy140	Hwy 58	172	-	172	4.5%	8	180	3%	185	900	0.20	0.21	A	A
	Hwy 58	Wainfleet	95	-	95	4.5%	4	100	3%	103	900	0.11	0.11	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,107	0	1,107	0.0%	-	1,107	3%	1,141	2,400	0.46	0.48	A	A
	Hwy 20	Hwy 58	1,967	0	1,968	0.0%	-	1,968	3%	2,027	2,400	0.82	0.84	D	D
	Hwy 58	Geneva St	2,629	0	2,629	0.0%	-	2,629	3%	2,708	2,400	1.10	1.13	F	F
	Geneva St	QEW	1,072	108	1,180	0.0%	-	1,180	3%	1,216	2,400	0.49	0.51	A	B
RHC Expressway	QEW	Barton	3,022	30	3,052	0.0%	-	3,052	3%	3,144	2,400	1.27	1.31	F	F
	Barton	Queensway	2,971	89	3,060	0.0%	-	3,060	3%	3,151	2,400	1.27	1.31	F	F
	Queensway	King	3,337	89	3,426	0.0%	-	3,426	3%	3,529	2,400	1.43	1.47	F	F
	King	Mud St	3,847	89	3,936	0.0%	-	3,936	3%	4,054	2,400	1.64	1.69	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara [illegible]s Assessment
Corridor Asses[illegible]nt
Revised Base Network w\ 10 lane QEW
High Tourist Condition
Year 2031 - Volumes

Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,890	312	2,201	0.0%	-	2,201	25%	2,752	3,600	0.61	0.76	B	C
	Hwy 420	Hwy 405	4,404	332	4,736	0.0%	-	4,736	25%	5,920	9,000	0.53	0.66	B	C
	Hwy 405	RR 55	6,277	593	6,869	0.0%	-	6,869	38%	9,480	9,000	0.76	1.05	C	F
	RR 55	Ontario Street	6,277	593	6,869	0.0%	-	6,869	38%	9,480	7,500	0.92	1.26	E	F
	Ontario Street	Hwy 406	6,093	526	6,619	0.0%	-	6,619	38%	9,134	9,000	0.74	1.01	C	F
	Hwy 406	Fruitland	6,870	666	7,536	0.0%	-	7,536	25%	9,420	9,000	0.84	1.05	D	F
	Fruitland	Hwy 20	6,530	725	7,255	0.0%	-	7,255	3%	7,473	9,000	0.81	0.83	D	D
	Hwy 20	Hwy 403	6,511	713	7,224	0.0%	-	7,224	3%	7,441	7,500	0.96	0.99	E	E
Hwy 403	Brantford	Hwy 2	1,243	-	1,243	15.0%	186	1,430	3%	1,472	2,400	0.60	0.61	B	B
	Hwy 2	RHC Express.	2,561	162	2,723	15.0%	384	3,107	3%	3,200	3,600	0.86	0.89	D	D
	RHC Express.	Aberdeen	3,416	144	3,560	15.0%	512	4,073	3%	4,195	3,600	1.13	1.17	F	F
	Aberdeen	Hwy 6	6,858	85	6,943	0.0%	-	6,943	3%	7,152	6,000	1.16	1.19	F	F
	Hwy 6	QEW	7,157	73	7,230	0.0%	-	7,230	3%	7,447	5,400	1.34	1.38	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,487	-	1,487	6.5%	97	1,583	3%	1,631	1,600	0.99	1.02	E	F
	Rymal Rd	RHC Express.	1,214	-	1,214	6.5%	79	1,293	3%	1,332	1,600	0.81	0.83	D	D
	RHC Express.	Claremont	1,617	-	1,617	6.5%	105	1,722	3%	1,774	2,000	0.86	0.89	D	D
Hwy 53	Hwy 2	Fiddlers Green	234	-	234	12.0%	28	262	3%	269	2,400	0.11	0.11	A	A
	Fiddlers Green	Hwy 6	703	-	703	12.0%	84	787	3%	811	1,200	0.66	0.68	C	C
	Hwy 6	Hwy 56	929	-	929	12.0%	111	1,041	3%	1,072	2,400	0.43	0.45	A	A
Hwy 20	QEW	Queenston	2,144	179	2,323	0.0%	-	2,323	25%	2,904	1,600	1.45	1.81	F	F
	Queenston	Mud St	2,249	-	2,249	0.0%	-	2,249	25%	2,811	1,600	1.41	1.76	F	F
	Mud St	Hwy 53	1,225	4	1,229	0.0%	-	1,229	25%	1,537	2,400	0.51	0.64	B	B
	Hwy 53	RR 27	782	4	786	7.0%	55	841	25%	1,051	2,400	0.35	0.44	A	A
	RR 27	Fonthill	71	1	72	7.0%	5	77	25%	96	900	0.09	0.11	A	A
	Fonthill	Hwy 406	1,124	-	1,124	7.0%	79	1,202	25%	1,503	1,800	0.67	0.83	C	D
	Hwy 406	Hwy 58	916	-	916	7.0%	64	980	25%	1,225	900	1.09	1.36	F	F
	Hwy 58	Montrose Rd	1,498	-	1,498	7.0%	105	1,603	25%	2,003	1,600	1.00	1.25	F	F
Hwy 405	QEW	Q-L Bridge	2,033	260	2,293	0.0%	-	2,293	38%	3,165	3,600	0.64	0.88	B	D
Hwy 420	QEW	Stanley Ave	2,251	46	2,296	0.0%	-	2,296	25%	2,871	3,600	0.64	0.80	B	C
Hwy 58	Hwy 406	Hwy 3	424	27	451	0.0%	-	451	3%	464	900	0.50	0.52	B	B
Hwy 140	Welland	Hwy 3	434	-	434	7.0%	30	465	3%	479	800	0.58	0.60	B	B
Hwy 3	Fort Erie	Hwy 140	764	-	764	4.5%	34	799	3%	823	1,800	0.44	0.46	A	A
	Hwy140	Hwy 58	168	-	168	4.5%	8	175	3%	181	900	0.19	0.20	A	A
	Hwy 58	Wainfleet	97	-	97	4.5%	4	101	3%	104	900	0.11	0.12	A	A
	Wainfleet	West Gateway	8	-	8	4.5%	0	9	3%	9	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,162	28	1,189	0.0%	-	1,189	3%	1,225	2,400	0.50	0.51	A	B
	Hwy 20	Hwy 58	1,956	28	1,984	0.0%	-	1,984	3%	2,044	2,400	0.83	0.85	D	D
	Hwy 58	Geneva St	2,555	27	2,582	0.0%	-	2,582	3%	2,660	2,400	1.08	1.11	F	F
	Geneva St	QEW	1,166	156	1,322	0.0%	-	1,322	3%	1,362	2,400	0.55	0.57	B	B
RHC Expressway	QEW	Barton	3,478	51	3,529	0.0%	-	3,529	3%	3,635	2,400	1.47	1.51	F	F
	Barton	Queensway	3,029	144	3,173	0.0%	-	3,173	3%	3,268	2,400	1.32	1.36	F	F
	Queensway	King	3,350	144	3,494	0.0%	-	3,494	3%	3,599	2,400	1.46	1.50	F	F
	King	Mud St	3,922	144	4,067	0.0%	-	4,067	3%	4,189	2,400	1.69	1.75	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

MTO - Niagara [illegible]s Assessment
Corridor Asses[illegible]nt
Revised Base Network w\ MPC Alt. C
Alternative Landuse, High Tourist Condition
Year 2031 - Volumes

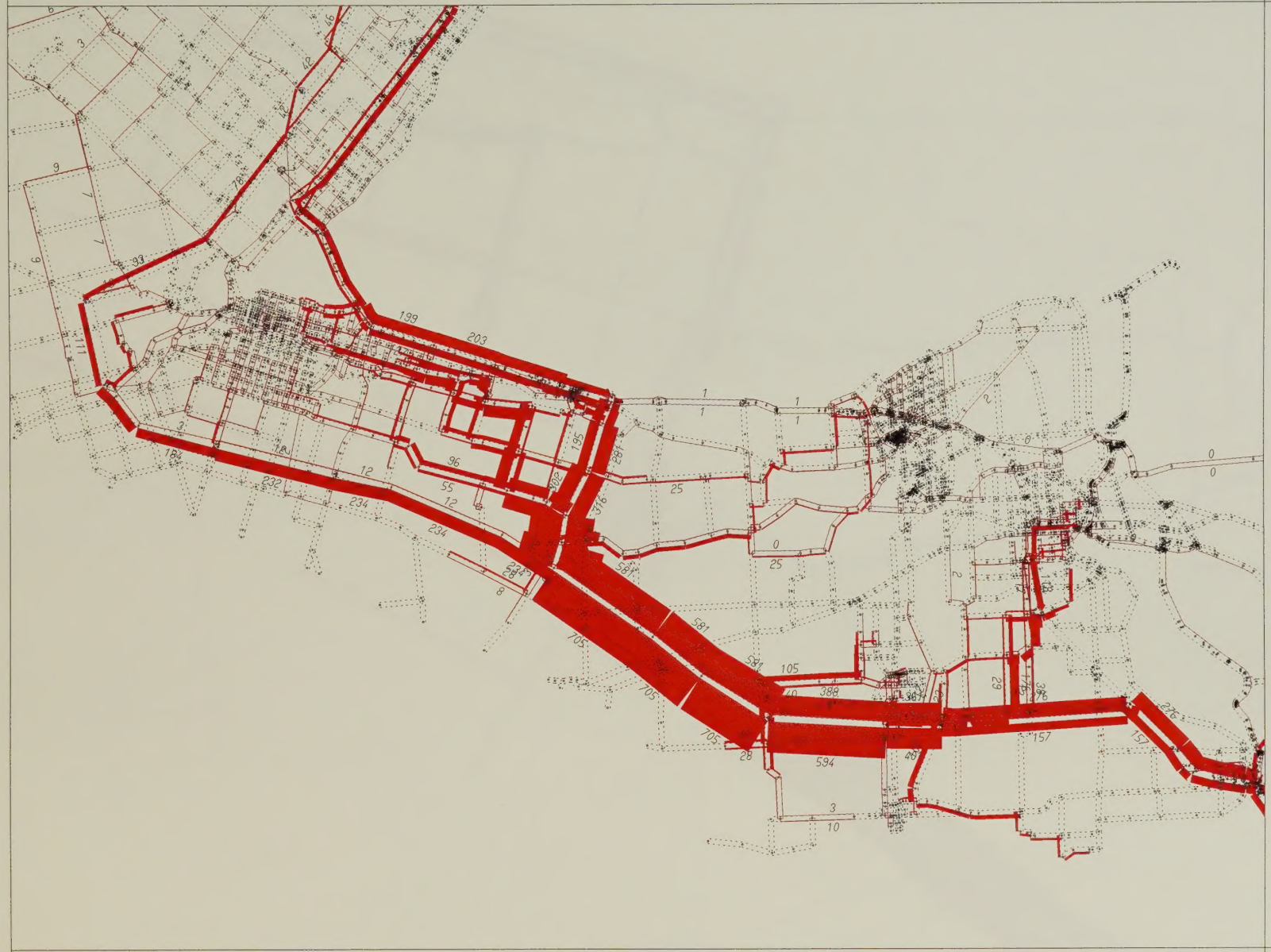
Facility	Section		Base Assignment - Peak Direction			Adjustment - Local Trucks			Adjustment - Design Hour			Volume/Capacity		Level of Service	
	From	To	Auto	Truck	Total	%	Trucks	Adj Total	%	Adj Total	Capacity	P.M. Pk Hour	Design Hour	P.M.Pk Hour	Design Hour
QEW	Fort Erie	Hwy 420	1,908	113	2,020	0.0%	-	2,020	25%	2,525	3,600	0.56	0.70	B	C
	Hwy 420	Hwy 405	3,450	73	3,523	0.0%	-	3,523	25%	4,404	5,400	0.65	0.82	C	D
	Hwy 405	RR 55	4,295	323	4,618	0.0%	-	4,618	38%	6,373	5,400	0.86	1.18	D	F
	RR 55	Ontario Street	4,295	323	4,618	0.0%	-	4,618	38%	6,373	4,500	1.03	1.42	F	F
	Ontario Street	Hwy 406	4,224	257	4,481	0.0%	-	4,481	38%	6,184	5,400	0.83	1.15	D	F
	Hwy 406	Fruitland	5,030	366	5,396	0.0%	-	5,396	25%	6,745	5,400	1.00	1.25	E	F
	Fruitland	Hwy 20	4,869	471	5,340	0.0%	-	5,340	3%	5,500	5,400	0.99	1.02	E	F
	Hwy 20	Hwy 403	5,437	490	5,927	0.0%	-	5,927	3%	6,105	6,000	0.99	1.02	E	F
Hwy 403	Brantford	Hwy 2	1,263	-	1,263	15.0%	189	1,452	3%	1,496	2,400	0.61	0.62	B	B
	Hwy 2	RHC Express.	3,025	17	3,042	15.0%	454	3,496	3%	3,600	3,600	0.97	1.00	E	F
	RHC Express.	Aberdeen	3,739	25	3,764	15.0%	561	4,325	3%	4,455	3,600	1.20	1.24	F	F
	Aberdeen	Hwy 6	8,272	138	8,410	0.0%	-	8,410	3%	8,662	6,000	1.40	1.44	F	F
	Hwy 6	QEW	6,506	144	6,651	0.0%	-	6,651	3%	6,850	5,400	1.23	1.27	F	F
Hwy 6	S of Rymal Rd	Rymal Rd	1,637	2	1,639	6.5%	106	1,745	3%	1,797	1,600	1.09	1.12	F	F
	Rymal Rd	RHC Express.	1,381	2	1,383	6.5%	90	1,473	3%	1,517	1,600	0.92	0.95	E	E
	RHC Express.	Claremont	2,135	2	2,137	6.5%	139	2,276	3%	2,344	2,000	1.14	1.17	F	F
Hwy 53	Hwy 2	Fiddlers Green	679	-	679	12.0%	81	760	3%	783	2,400	0.32	0.33	A	A
	Fiddlers Green	Hwy 6	1,068	-	1,068	12.0%	128	1,196	3%	1,232	1,200	1.00	1.03	E	F
	Hwy 6	Hwy 56	1,035	-	1,035	12.0%	124	1,159	3%	1,194	2,400	0.48	0.50	A	A
Hwy 20	QEW	Queenston	2,445	179	2,624	0.0%	-	2,624	25%	3,280	1,600	1.64	2.05	F	F
	Queenston	Mud St	2,578	8	2,587	0.0%	-	2,587	25%	3,234	1,600	1.62	2.02	F	F
	Mud St	Hwy 53	2,013	22	2,035	0.0%	-	2,035	25%	2,544	2,400	0.85	1.06	D	F
	Hwy 53	RR 27	913	4	917	7.0%	64	981	25%	1,226	2,400	0.41	0.51	A	B
	RR 27	Fonthill	585	-	585	7.0%	41	626	25%	782	900	0.70	0.87	C	D
	Fonthill	Hwy 406	1,538	-	1,538	7.0%	108	1,645	25%	2,057	1,800	0.91	1.14	E	F
	Hwy 406	Hwy 58	975	-	975	7.0%	68	1,043	25%	1,304	900	1.16	1.45	F	F
	Hwy 58	Montrose Rd	1,609	-	1,609	7.0%	113	1,722	25%	2,152	1,600	1.08	1.34	F	F
Hwy 405	QEW	Q-L Bridge	1,765	249	2,014	0.0%	-	2,014	38%	2,779	3,600	0.56	0.77	B	C
Hwy 420	QEW	Stanley Ave	2,556	50	2,606	0.0%	-	2,606	25%	3,257	3,600	0.72	0.90	C	E
Hwy 58	Hwy 406	Hwy 3	453	49	502	0.0%	-	502	3%	518	900	0.56	0.58	B	B
Hwy 140	Welland	Hwy 3	424	-	424	7.0%	30	454	3%	468	800	0.57	0.58	B	B
Hwy 3	Fort Erie	Hwy 140	559	-	559	4.5%	25	584	3%	602	1,800	0.32	0.33	A	A
	Hwy140	Hwy 58	300	-	300	4.5%	13	313	3%	322	900	0.35	0.36	A	A
	Hwy 58	Wainfleet	103	-	103	4.5%	5	108	3%	111	900	0.12	0.12	A	A
	Wainfleet	West Gateway	9	-	9	4.5%	0	9	3%	10	900	0.01	0.01	A	A
Hwy 406	East Main Street	Hwy 20	1,263	1	1,264	0.0%	-	1,264	3%	1,302	2,400	0.53	0.54	B	B
	Hwy 20	Hwy 58	2,236	1	2,237	0.0%	-	2,237	3%	2,304	2,400	0.93	0.96	E	E
	Hwy 58	Geneva St	2,713	0	2,713	0.0%	-	2,713	3%	2,795	2,400	1.13	1.16	F	F
	Geneva St	QEW	1,086	102	1,188	0.0%	-	1,188	3%	1,224	2,400	0.50	0.51	A	B
RHC Expressway	QEW	Barton	3,935	-	3,935	0.0%	-	3,935	3%	4,053	2,400	1.64	1.69	F	F
	Barton	Queensway	3,439	0	3,439	0.0%	-	3,439	3%	3,542	2,400	1.43	1.48	F	F
	Queensway	King	3,945	17	3,962	0.0%	-	3,962	3%	4,081	2,400	1.65	1.70	F	F
	King	Mud St	4,563	17	4,580	0.0%	-	4,580	3%	4,718	2,400	1.91	1.97	F	F

Note: Trucks assigned as Passenger Car Equivalents (2x) but presented in above table as truck vehicles.

APPENDIX L
SENSITIVITY TESTS – SELECT LINK ANALYSIS

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 27.175

100
200
300
400
500

WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4187: 2031 pmpkhr HIGH-Rev Base Net w\MPC Alt.C2 select link

02-07-09 14:13
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2

LINKS:
c i=0
& c j=0

SCALE: 27.175

100
200
300
400
500

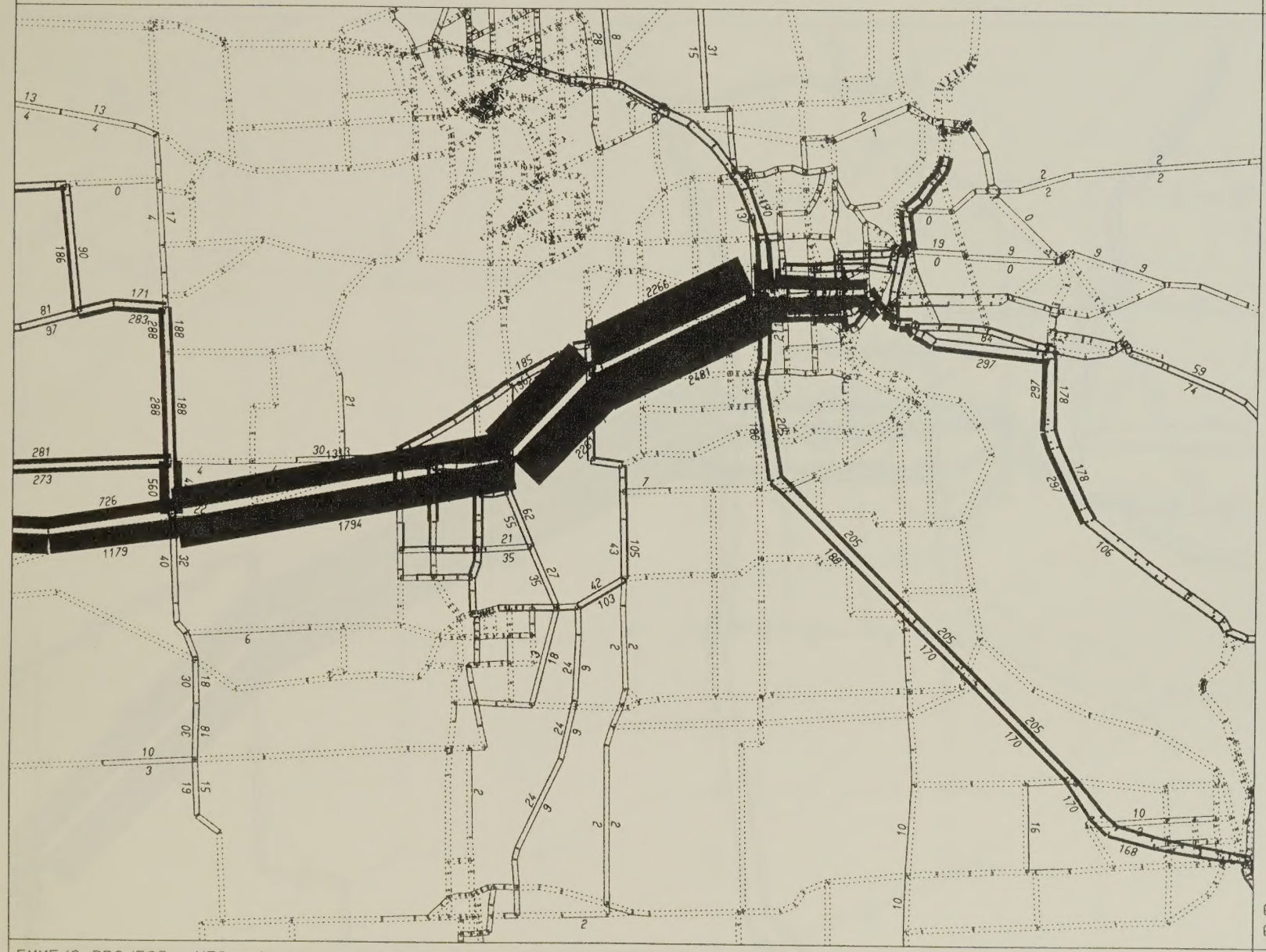
WINDOW:
599361/ 760481
632901/ 785636

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4187: 2031 pmpkhr HIGH-Rev Base Net w\MPC Alt.C2 select link

02-07-09 14:13
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 82.711

200
400
600
800
1000

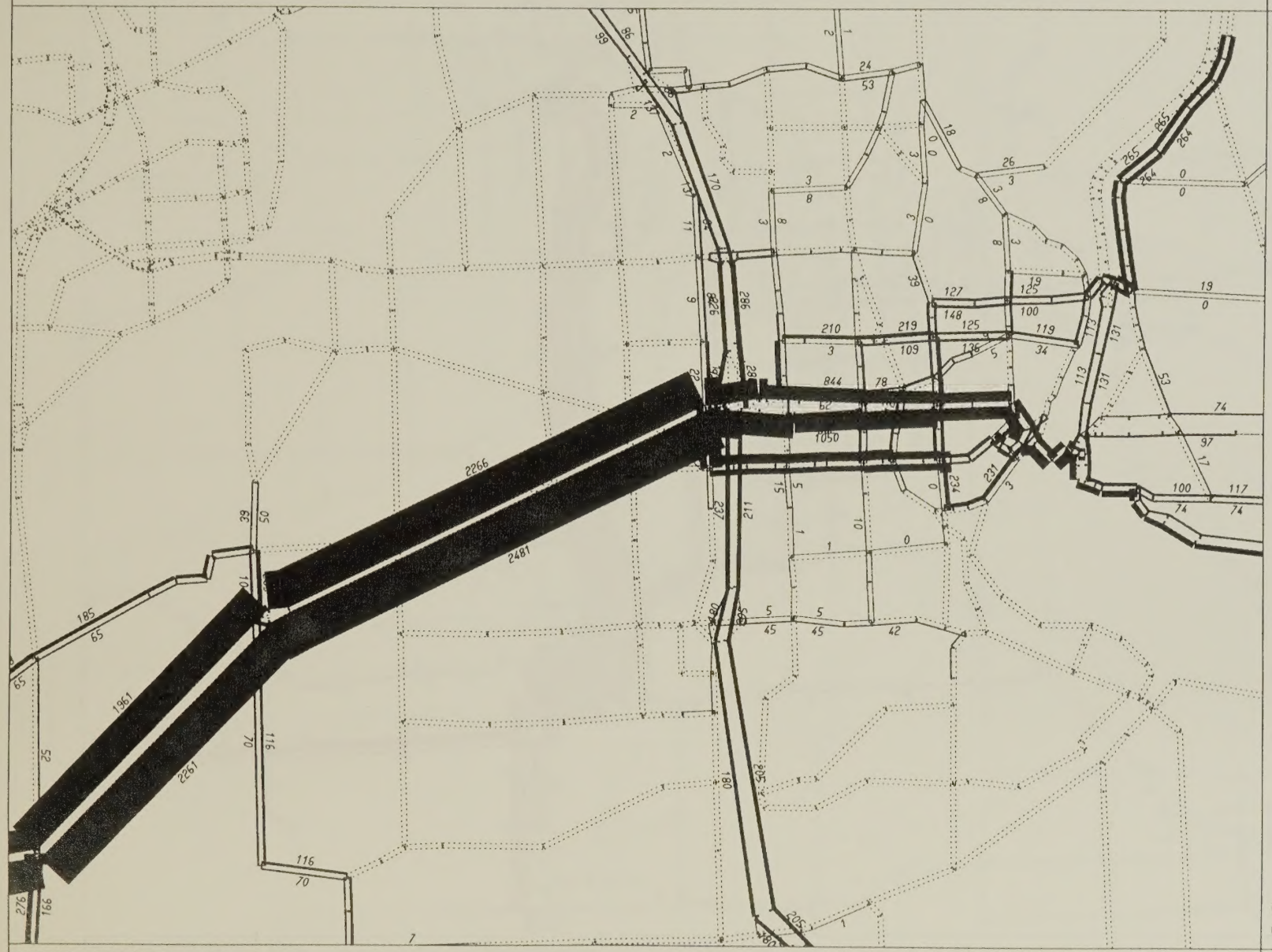
WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4202: Year 2031 pmpkhr HIGH- MPC Alt.E select link

01-05-10 10:38
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 82.711

200
400
600
800
1000

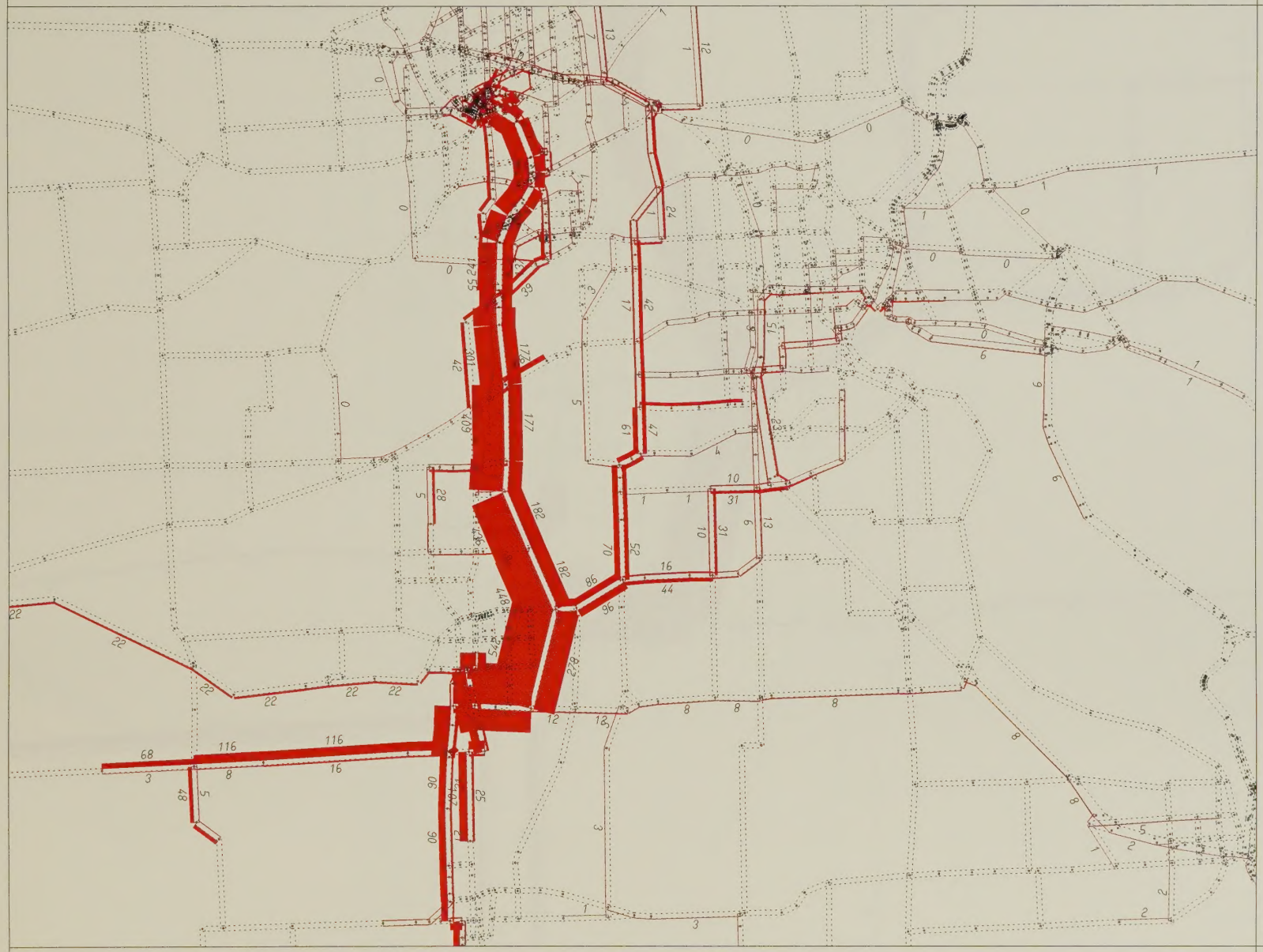
WINDOW:
643344/ 765736
660195/ 778374

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4202: Year 2031 pmpkhr HIGH- MPC Alt.E select link

01-05-10 10:38
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
ci=0
& cj=0

SCALE: 18.072

50
100
150
200
250

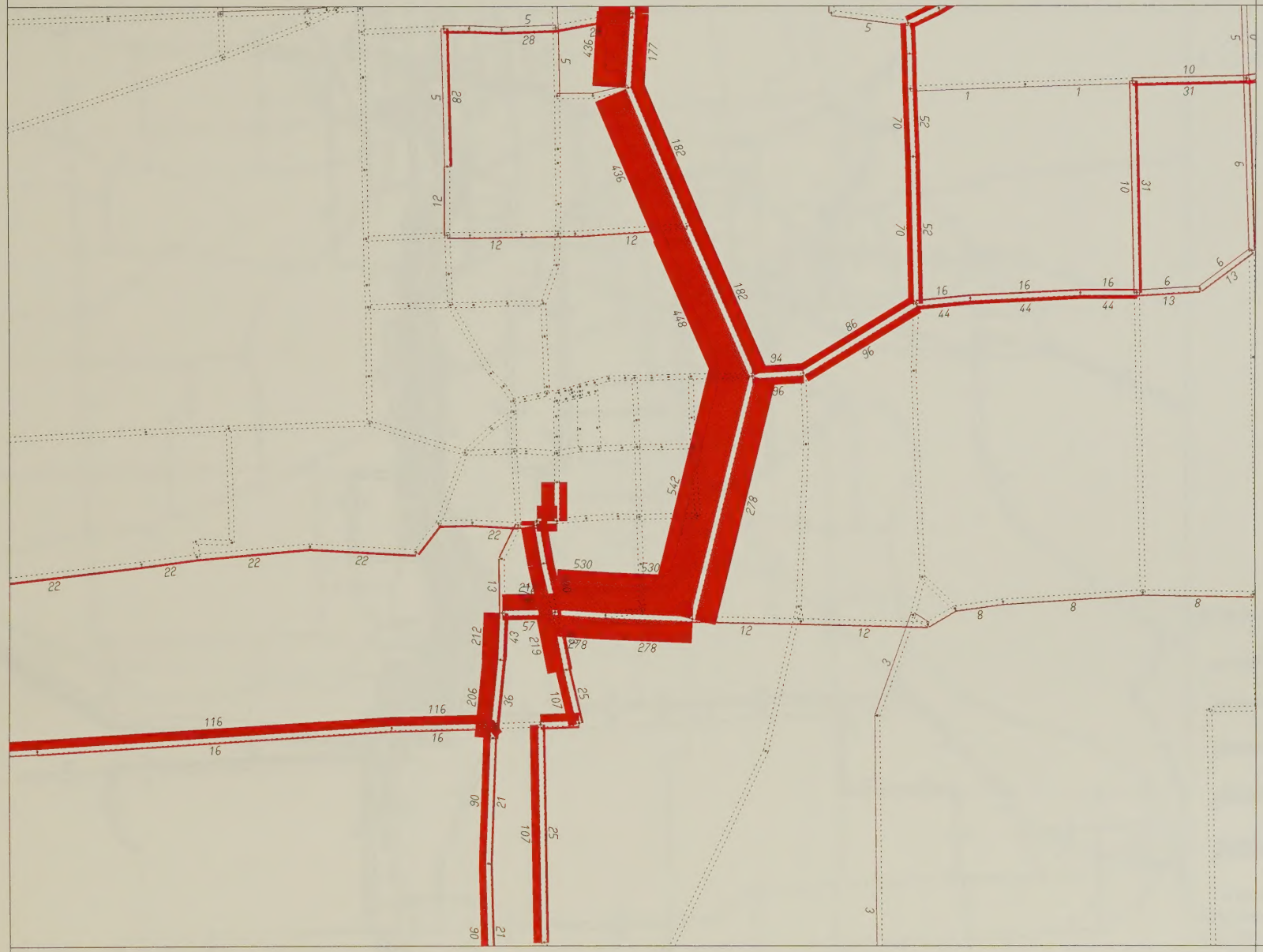
WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4132: Year 2031 pmpkhr HIGH-Rev Base Net select link 406 ext

02-07-09 14:50
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2

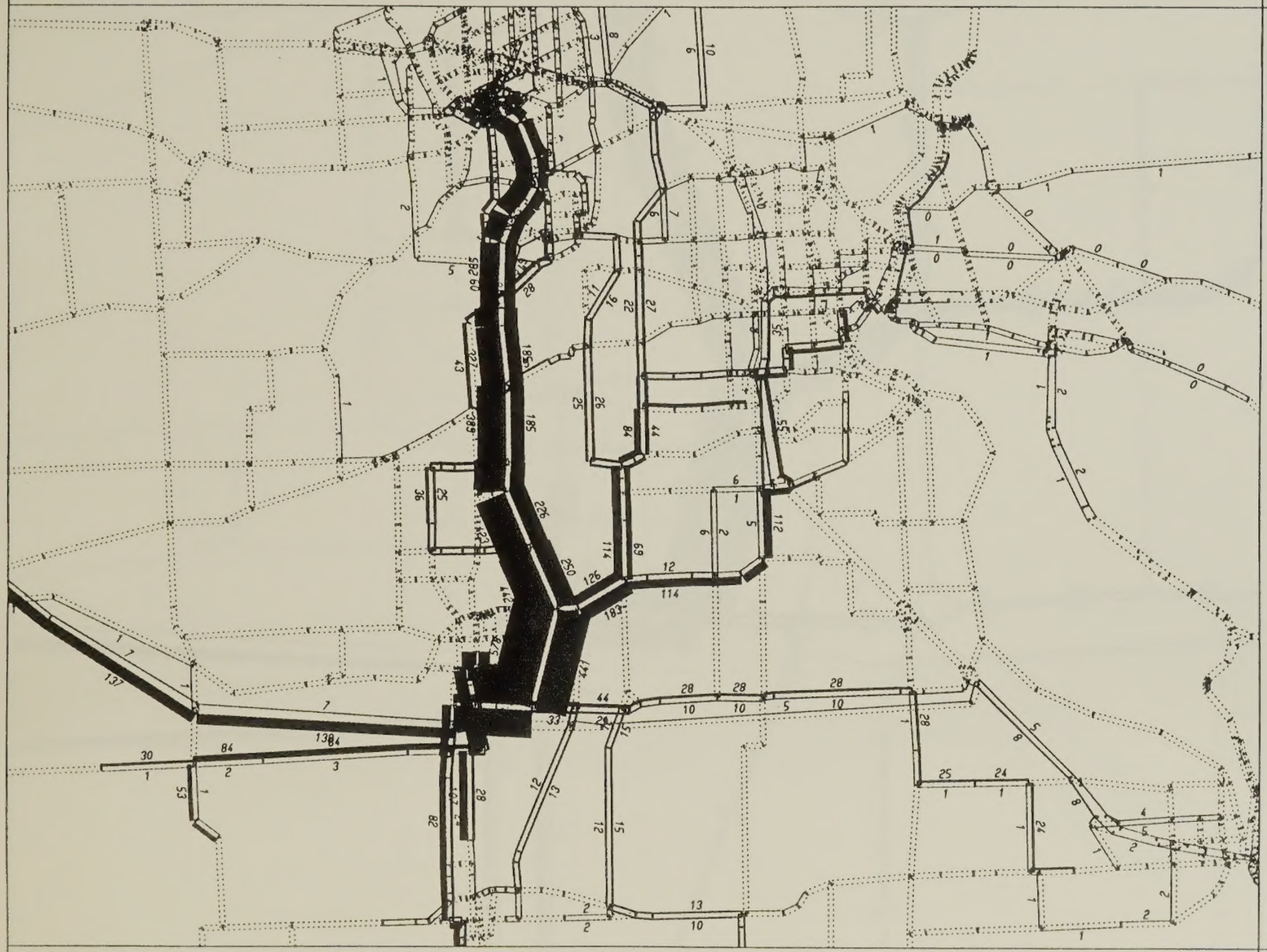


EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4132: Year 2031 pmpkhr HIGH-Rev Base Net select link 406 ext

02-07-09 14:50
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i =0
& c j =0

SCALE: 19.278

50
100
150
200
250

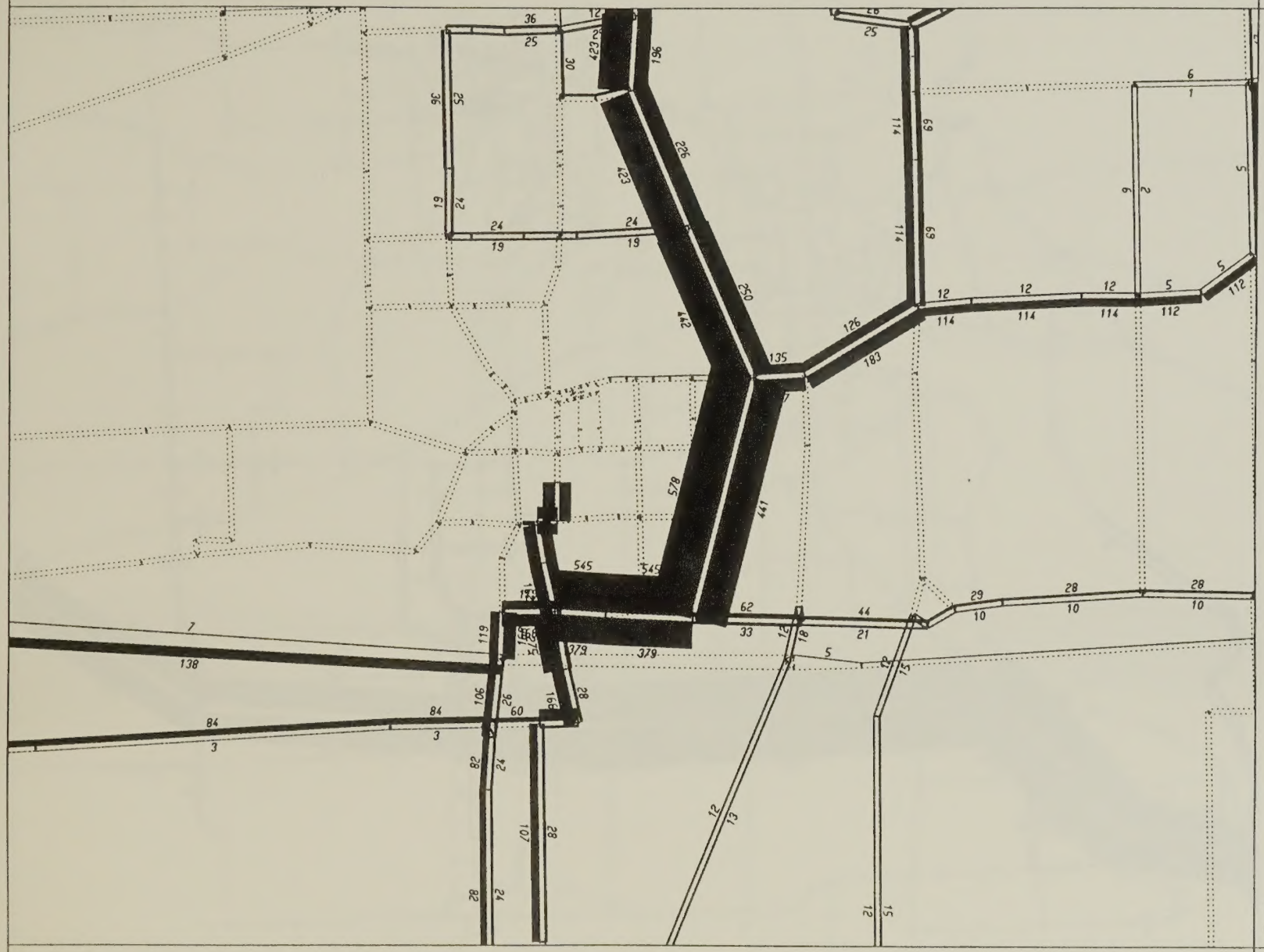
WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4181: Year 2031 pmpkhr HIGH- MPC Alt.C select link 406 ext

01-05-09 11:36
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2

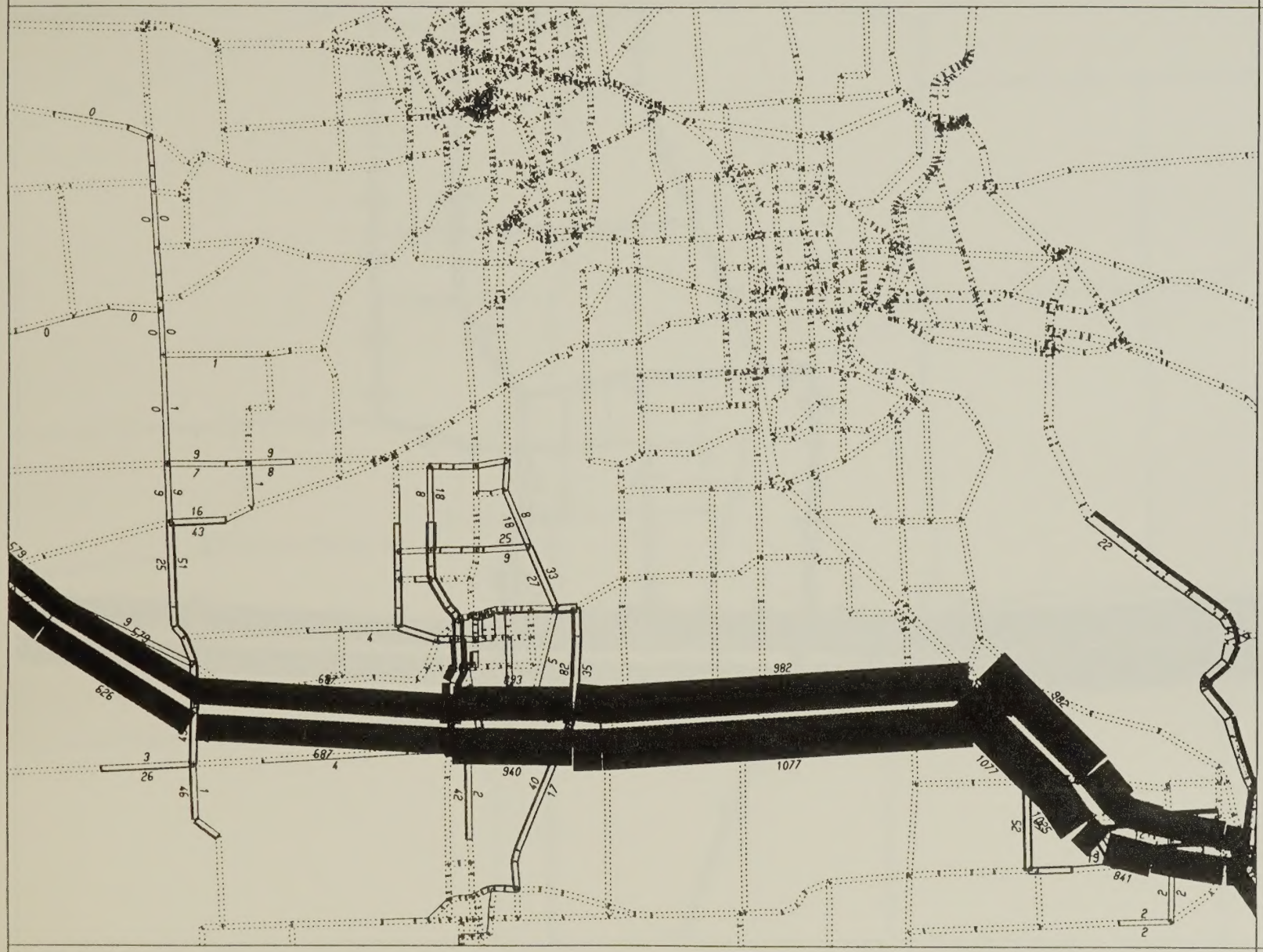


EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4181: Year 2031 pmpkhr HIGH- MPC Alt.C select link 406 ext

01-05-09 11:36
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
ci=0
& cj=0

SCALE: 35.89

100
200
300
400
500

WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4182: Year 2031 pmpkhr HIGH-MPC Alt.C select link MPC

01-05-09 11:37
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2

LINKS:
c i=0
& c j=0

SCALE: 35.89

100
200
300
400
500

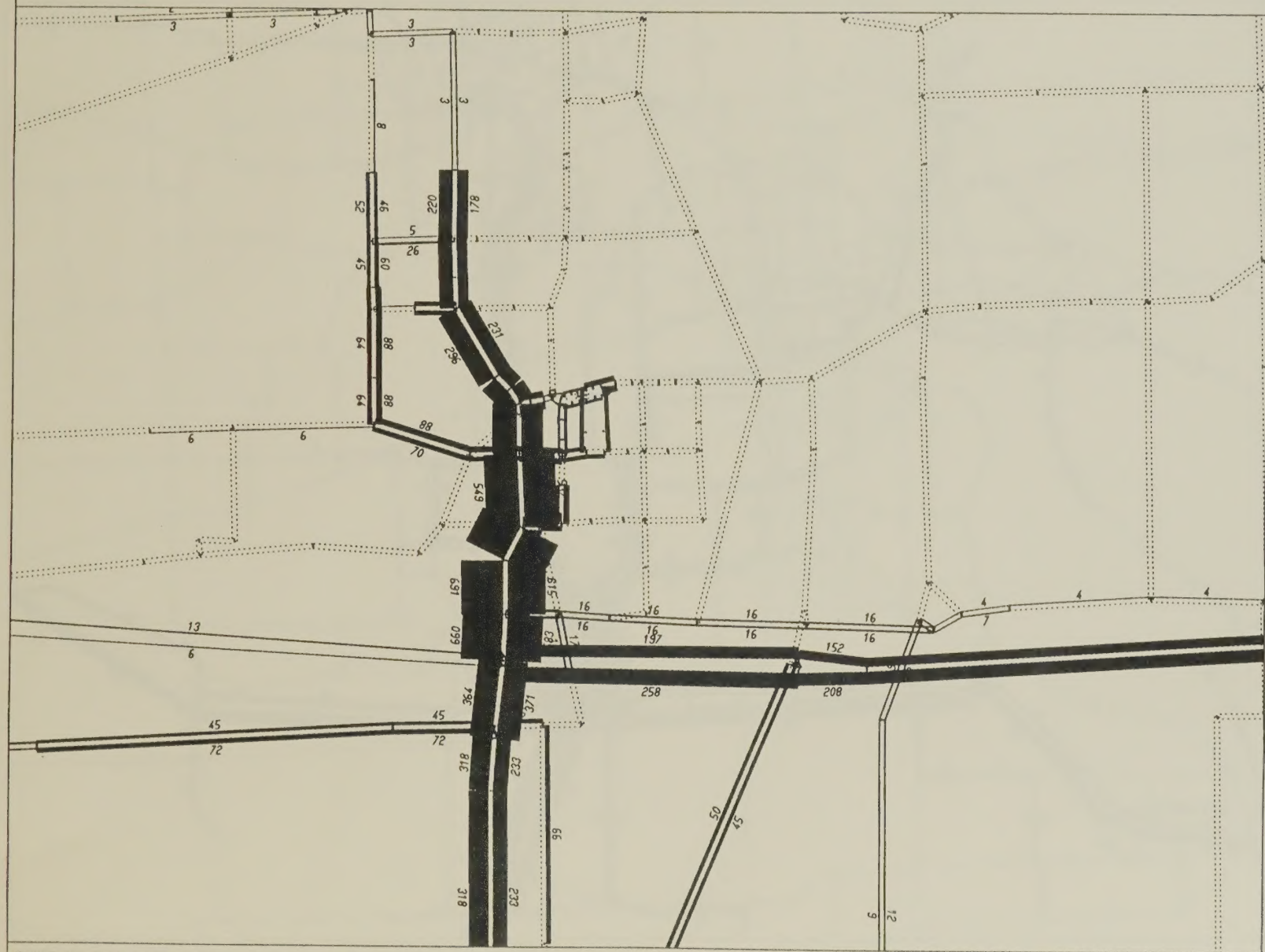
WINDOW W:
634385/ 752895
653063/ 766903

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4182: Year 2031 pmpkhr HIGH-MPC Alt.C select link MPC

01-05-09 11:37
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i =0
& c j =0

SCALE: 23.043

50
100
150
200
250

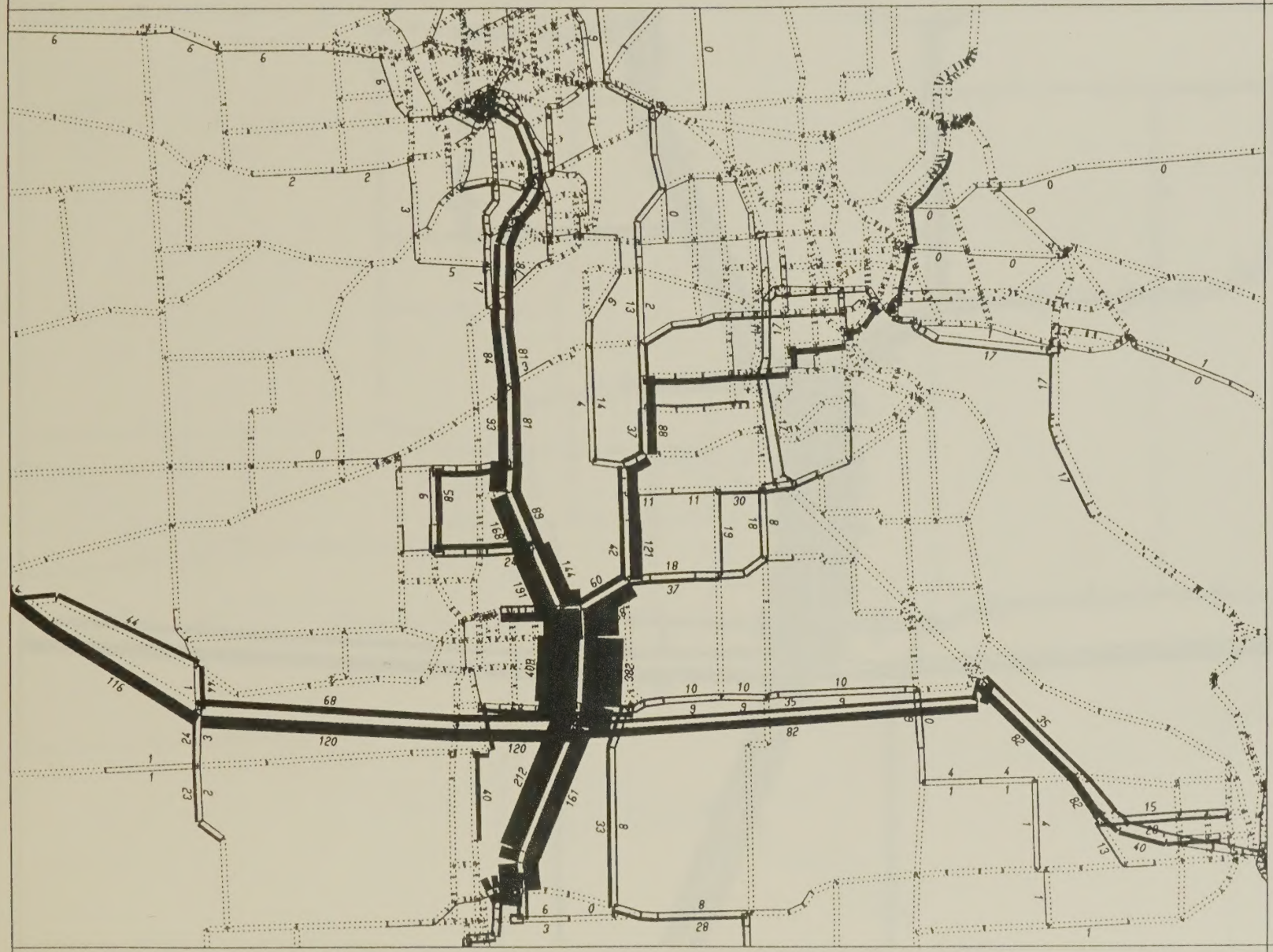
WINDOW W:
634385/ 752895
653063/ 766903

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4183: Year 2031 pmpkhr HIGH-MPC Alt.C select link Hwy 58

01-05-09 11:38
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 13.631

50
100
150
200
250

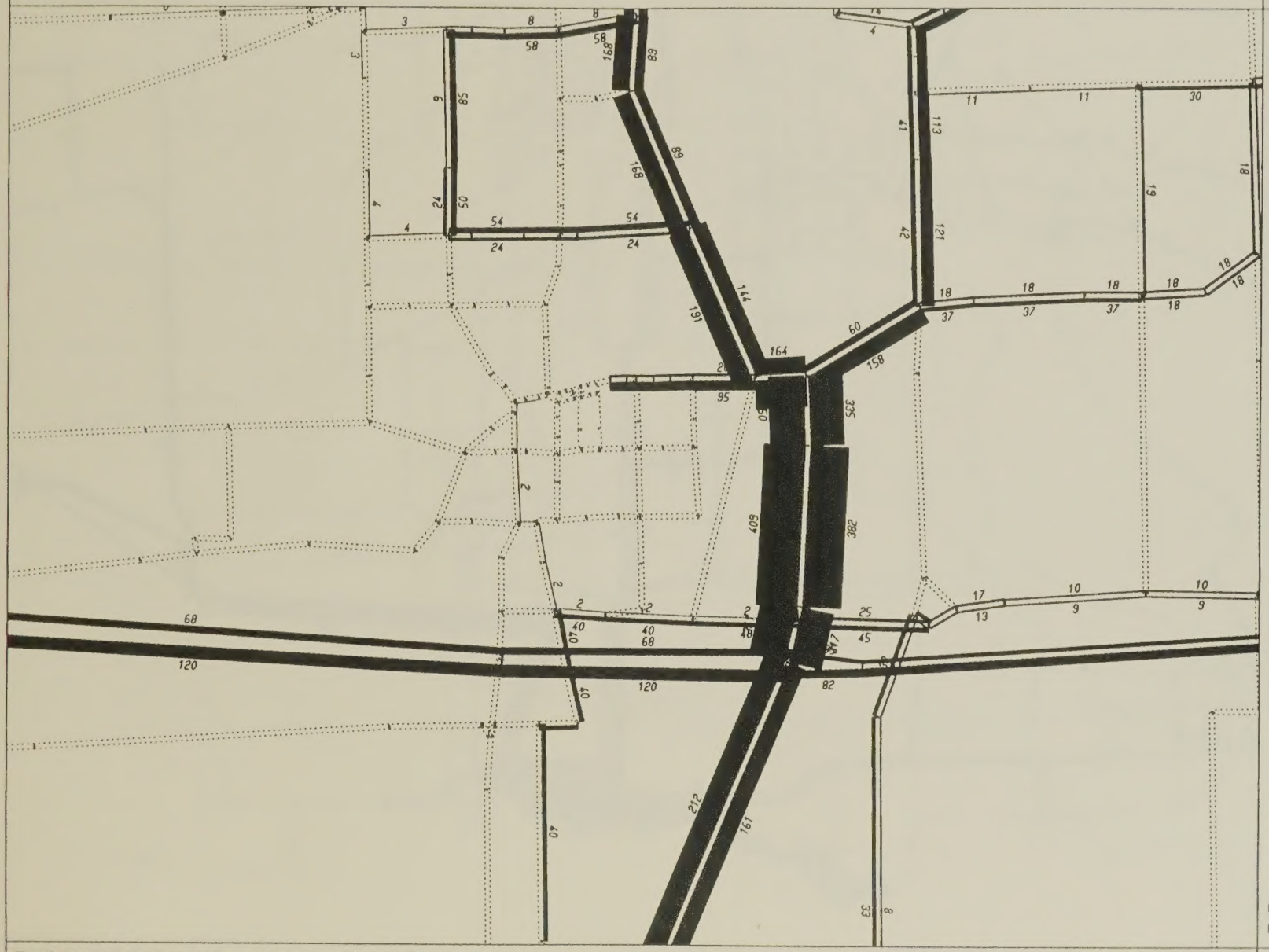
WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4184: Year 2031 pmpkhr HIGH-MPC Alt.C select link Hwy 140

01-05-09 11:39
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 13.631

50
100
150
200
250

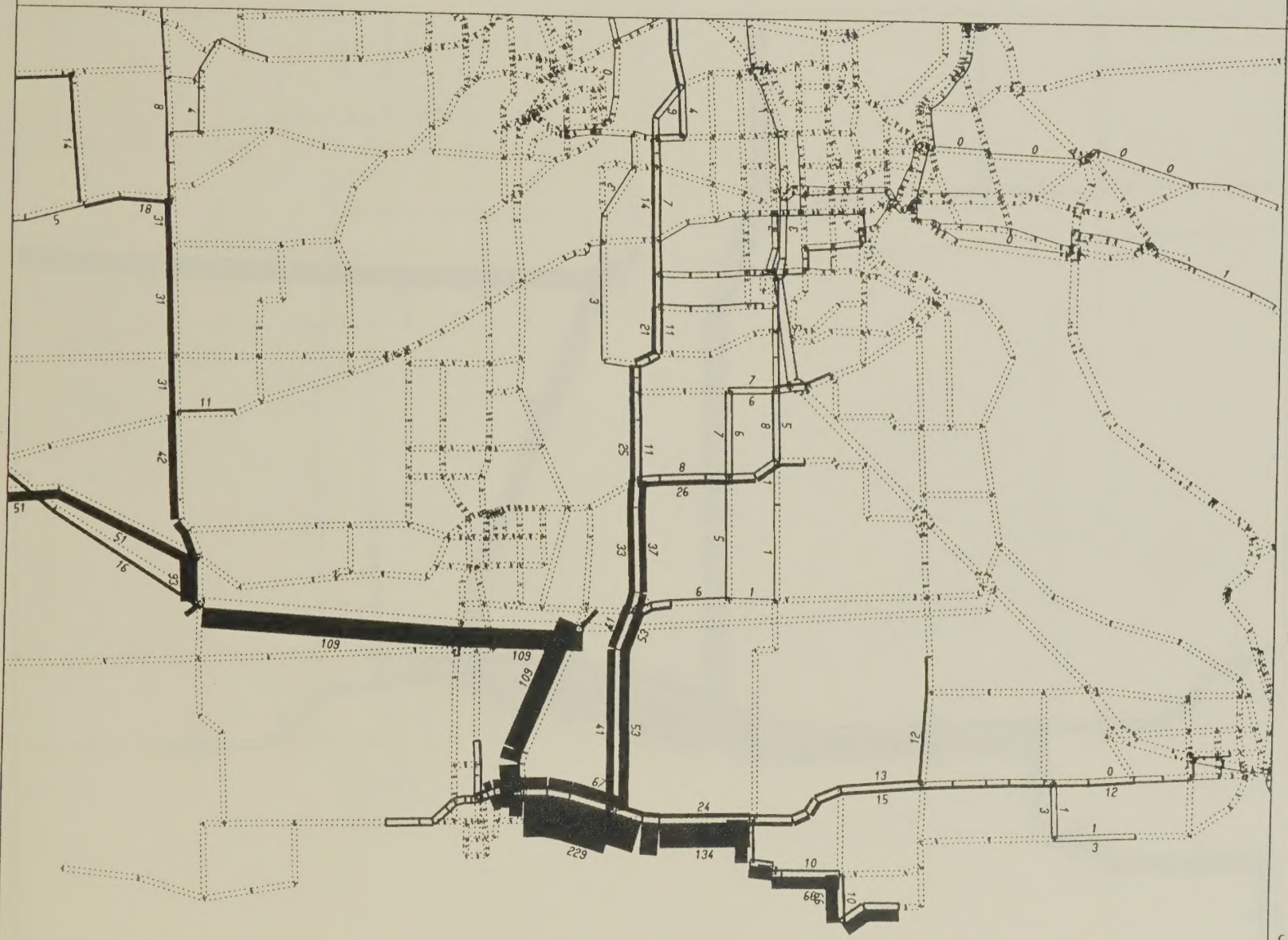
WINDOW W:
634385/ 752895
653063/ 766903

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4184: Year 2031 pmpkhr HIGH-MPC Alt.C select link Hwy 140

01-05-09 11:39
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 7.6287

20
40
60
80
100

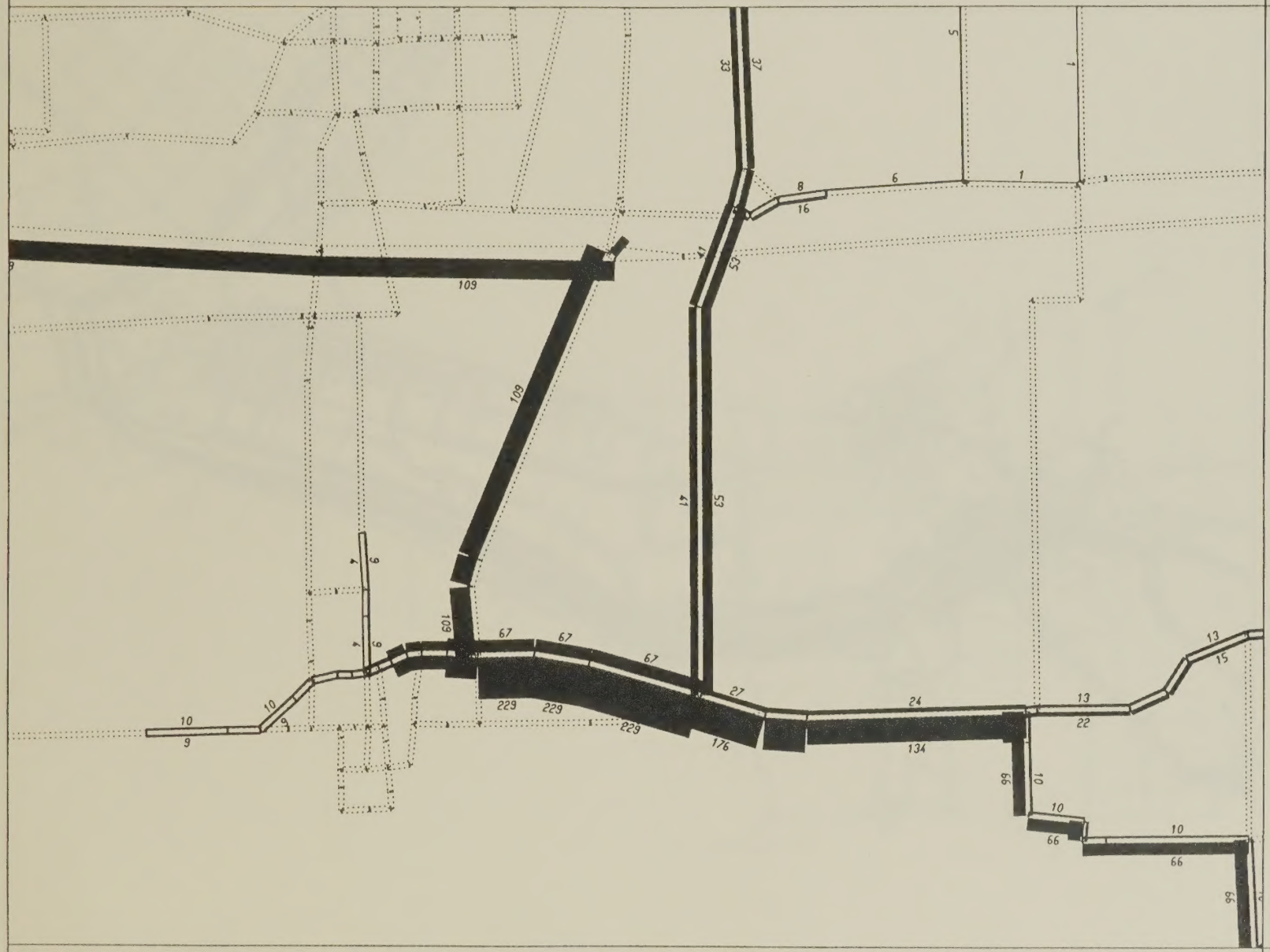
WINDOW:
625325/ 744875
671006/ 779135

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4185: Year 2031 pmpkhr HIGH-MPC Alt.C select link Hwy 3

01-05-09 11:40
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
ci=0
& cj=0

SCALE: 7.6287

20
40
60
80
100

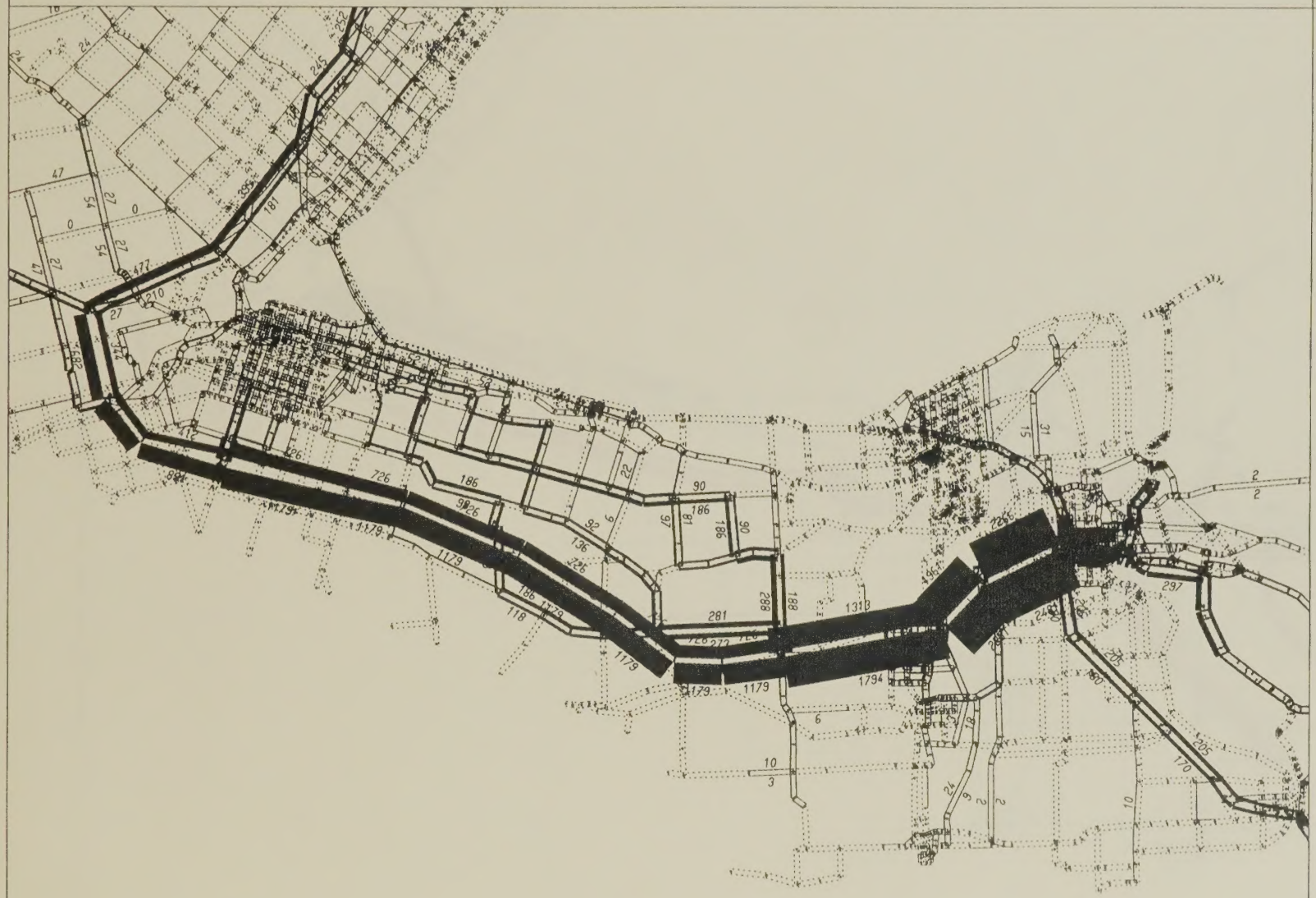
WINDOW:
637125/ 746783
655803/ 760791

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4185: Year 2031 pmpkhr HIGH-MPC Alt.C select link Hwy 3

01-05-09 11:40
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS
ci=0
& cj=0

SCALE: 82.711

200
400
600
800
1000

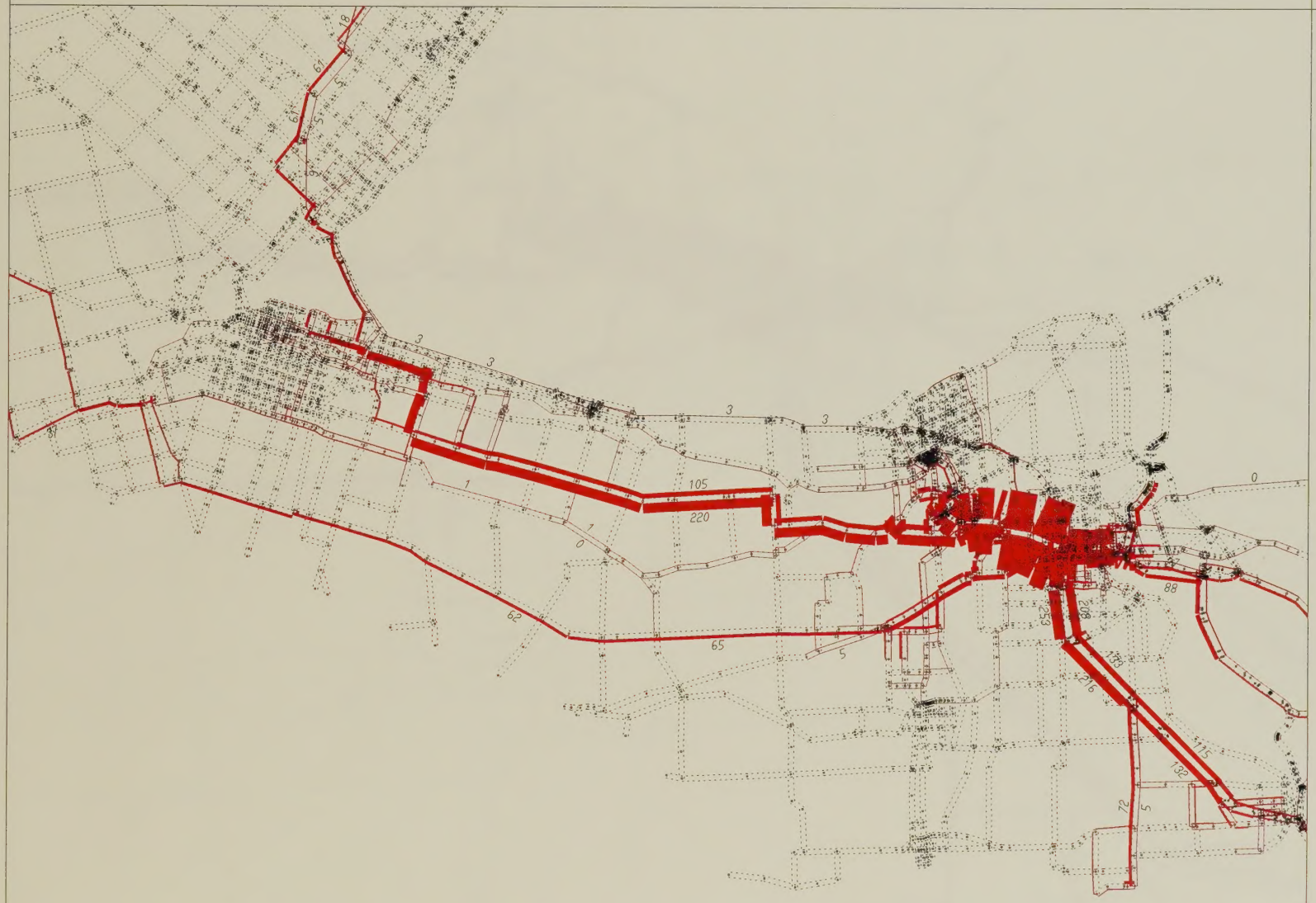
WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4202: Year 2031 pmpkhr HIGH- MPC Alt.E select link

01-05-10 10:38
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 33.564

100
200
300
400
500

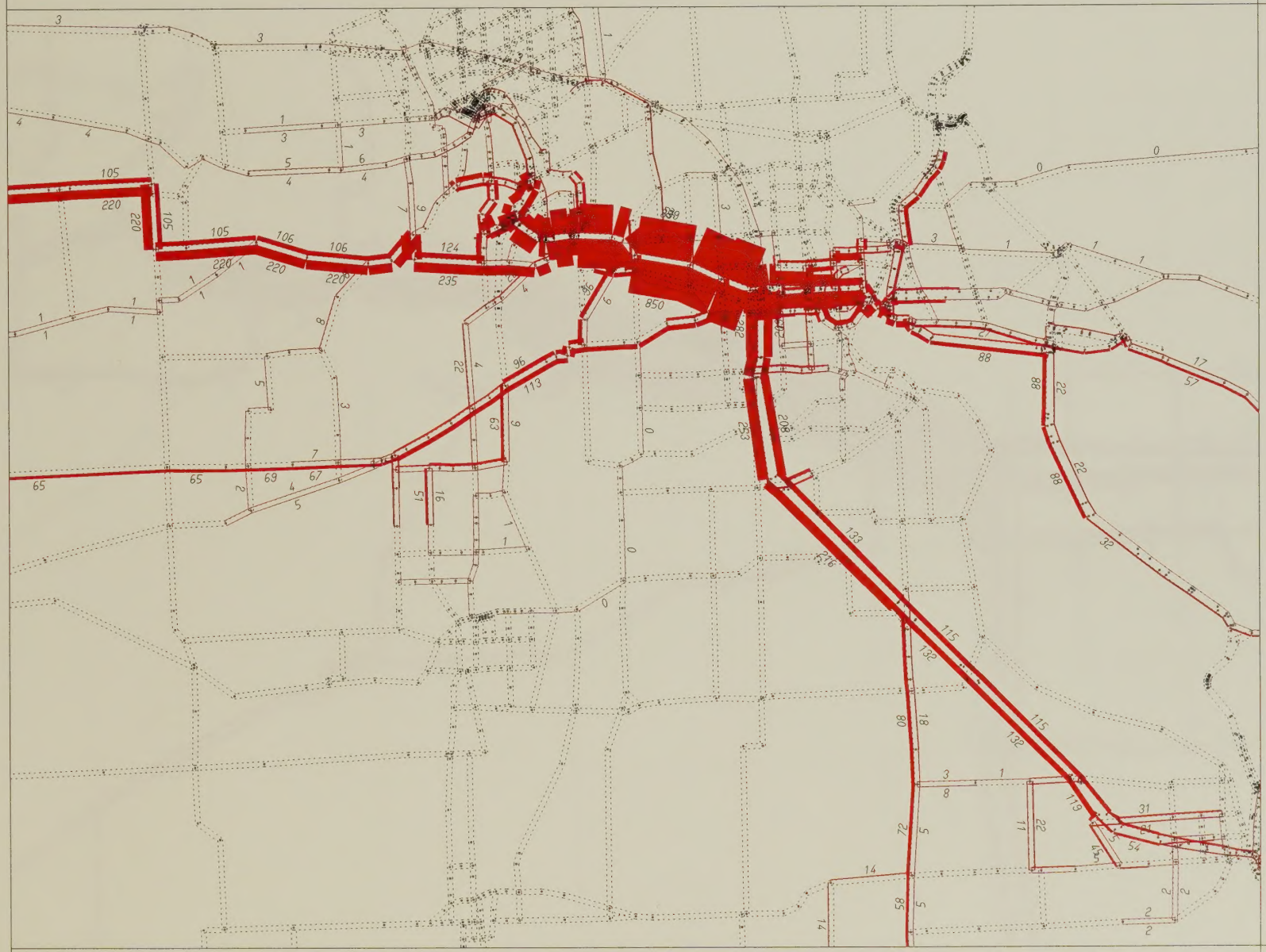
WINDOW Q:
572276/ 739519
671571/ 813990

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4143: 2031 Rev Base Net w\8 Lane QEW&420 ext select link

02-07-09 17:00
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
c i=0
& c j=0

SCALE: 33.564

100
200
300
400
500

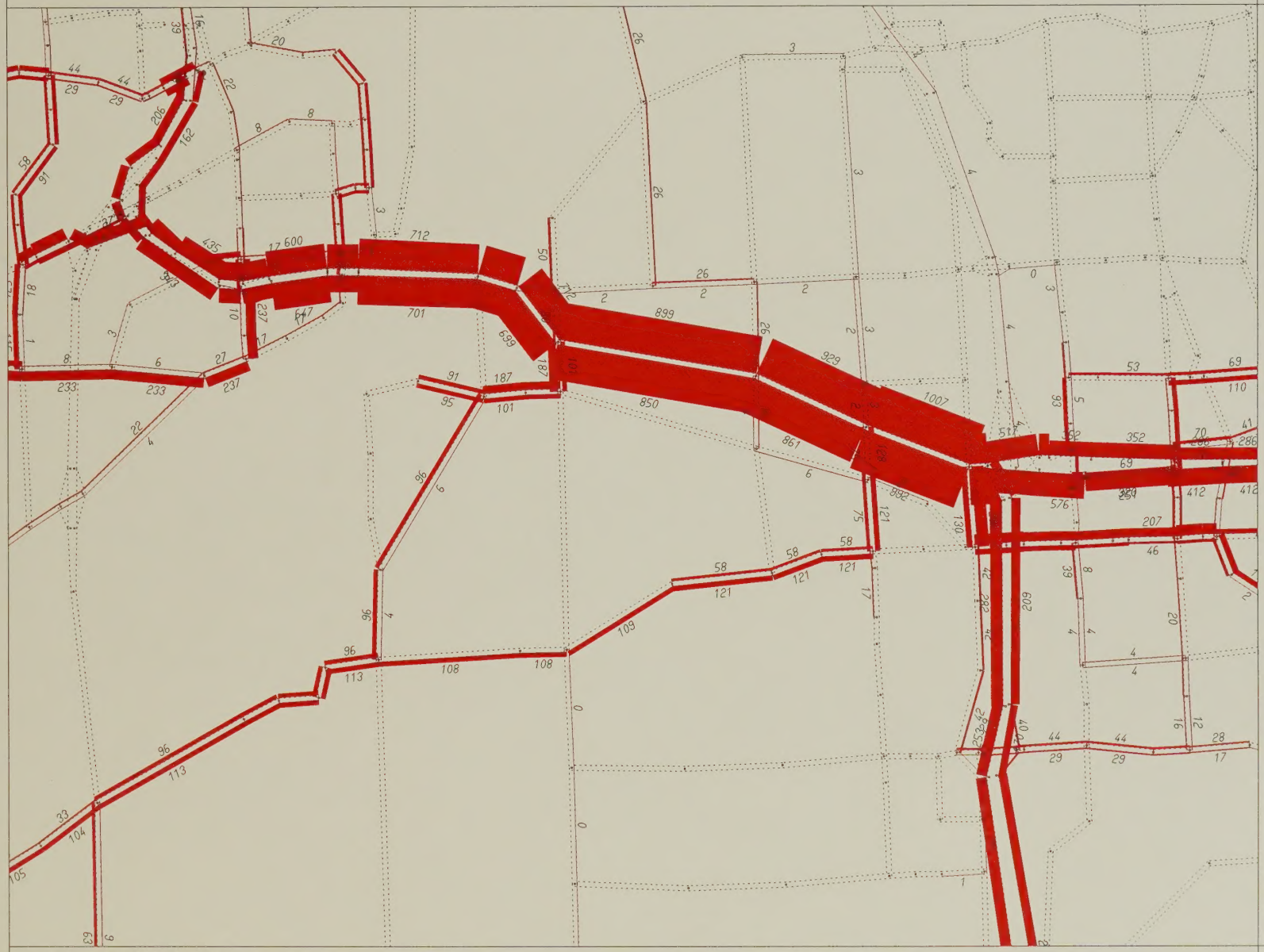
WINDOW Z:
625528/ 749088
671209/ 783348

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4143: 2031 Rev Base Net w\8 Lane QEW&420 ext select link

02-07-09 17:01
MODULE: 6.12
TSH.....dd

ADDITIONAL VOLUMES ON AUTO NETWORK

emme/2



LINKS:
ci=0
& cj=0

SCALE: 33.564

100
200
300
400
500

WINDOW:
642785/ 768102
655627/ 777733

EMME/2 PROJECT: MTO - Niagara Needs Assessment
SCENARIO 4143: 2031 Rev Base Net w\8 Lane QEW&420 ext select link

02-07-09 17:02
MODULE: 6.12
TSH.....dd

APPENDIX M

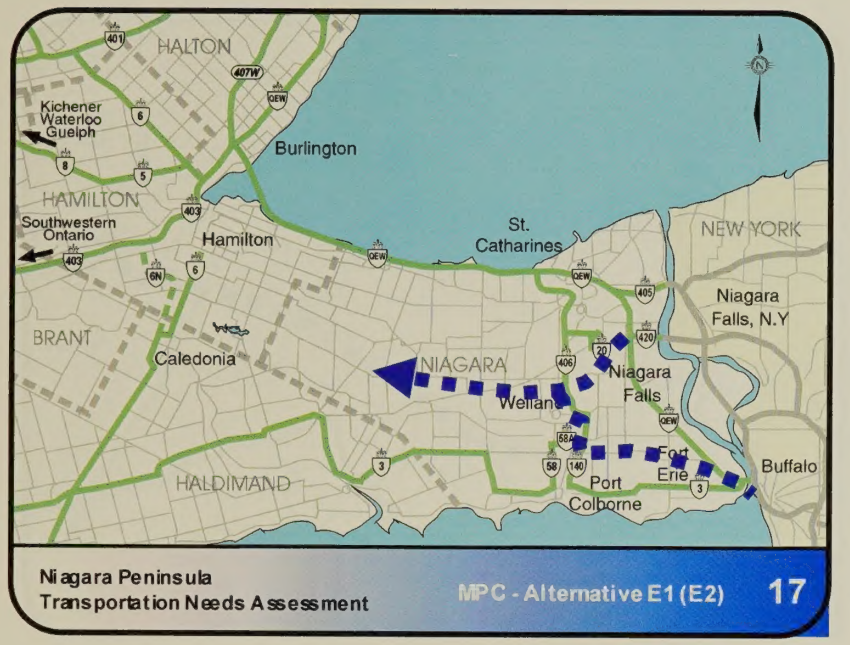
Conclusions

- 2-lane volume on MPC
- congestion issue at Hwy 20/Red Hill Creek
- problems remain on Burlington Skyway and Highway 403
- poor network performance in Hamilton
- diverts approximately 1200 vehicles (peak direction) from Peace Bridge/QEW to MPC (10-15% trucks)

- 2 lane volume on MPC
- problems remain on Burlington Skyway and Highway 403
- poor network performance in Hamilton
- diverts approximately 1300 vehicles (peak direction) from Peace Bridge/QEW to MPC (10-15% trucks)

- 2-lane volume on MPC through Niagara
- 4-lane volume on MPC around Hamilton
- relief to Highway 403/Burlington Skyway
- improved network performance in Hamilton
- diverts approximately 1600 vehicles (peak direction) from Peace Bridge/QEW to MPC (10-15% trucks)
- diversion of Peace Bridge traffic to MPC [>50%]

- 4-lane volume on MPC between Niagara Falls and St Catharines
- 2-lane volume on MPC west of Font Hill
- 4-lane volume on MPC around Hamilton
- little no diversion of Peace Bridge volume (<10%)
- diverts approximately 200 vehicles (peak direction) from Peace Bridge to MPC (6% trucks)
- diverts approximately 1200 vehicles (peak direction) from QEW to MPC (6% trucks)



- lower volume on MPC between Niagara Falls and St Catharines (compared to Alt D)
- lower volume on MPC QEW to Hwy 406 (compared to Alt C)
- same volume on MPC west of Font Hill (compared to Alt C and Alt D)
- diverts approximately 200 vehicles (peak direction) from Peace Bridge to MPC (6% trucks)
- diverts approximately 1200 vehicles (peak direction) from QEW to MPC (6% trucks)

- same as Alt C to Hamilton
- replaces function of Highway 6
- problems remain on Burlington Skyway and Highway 403
- diverts approximately 1200 vehicles (peak direction) from Peace Bridge/QEW to MPC (10-15% trucks)

Recommended Roadway Improvements

Legend: Provincial
- Now to 2011
- Beyond 2011

Legend: Municipal
- Now to 2011
- Beyond 2011

June 2001

Recommended Studies

Legend:
Now - 2011
Beyond 2011

June 2001

QEW WB west of Glendale
[Hourly Volume Profile - Top 200 Hours from 1999]